ADOLESCENT MENTAL HEALTH FROM A PSYCHOSOCIAL PERSPECTIVE

Well-Being, Internalizing Problems, and Relationships with Parents and Friends

CHANTAL CHARISSA LUIJTEN

Adolescent Mental Health from a Psychosocial Perspective: Well-Being, Internalizing Problems, and Relationships with Parents and Friends

Chantal Charissa Luijten

ISBN: 978-94-6361-783-3
Layout and printed by Optima Grafische Communicatie (www.ogc.nl)
Cover design by Erwin Timmerman, Optima Grafische Communicatie

Adolescent Mental Health from a Psychosocial Perspective:
Well-Being, Internalizing Problems, and Relationships with Parents and Friends

Mentale gezondheid van adolescenten vanuit een psychosociaal perspectief:
Welzijn, internaliserende problemen en relaties met ouders en vrienden

Proefschrift

ter verkrijging van de graad van doctor aan de
Erasmus Universiteit Rotterdam
op gezag van de
rector magnificus

Prof.dr. A.L. Bredenoord

en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op
22 december 2022 om 10.30 uur

door

Chantal Charissa Luijten
geboren te Amsterdam

Erasmus University Rotterdam

PROMOTIECOMMISSIE:

Promotor(en):	Prof.dr. Anna Petra Nieboer
Overige leden:	Prof.dr. Jane Murray Cramm Prof.dr. Marloes Kleinjan Prof.dr. Hein Raat
Copromotor:	Dr. Daphne van de Bongardt

TABLE OF CONTENT

1

General introduction

GENERAL INTRODUCTION

Adolescence is a period characterized by significant physical, psychological, and social changes (Gray et al., 2012; Sawyer et al., 2012), including hormonal changes associated with pubertal development, increasing academic expectations, and changing social relationships with parents and peers. Although these transformations are normative for this developmental stage, they can be challenging and may place adolescents' mental health at risk. Globally, one third up to half of all mental health problems start before the ages of 14 and 18 years, respectively (for a meta-analysis, see Solmi et al., 2022). Furthermore, lower levels of mental health among adolescents tend to have chronic, recurring courses and can persist into (young) adulthood (Costello et al., 2011; Otto et al., 2021). Because of this, adolescent mental health is recognized as a major priority in research, clinical and educational practice, and public health policy development (Parkin, Long, & Gheera, 2019;World Health Organization, 2013; Wykes et al., 2021). In light of this, it is crucial to identify factors that protect and promote adolescent mental health for the development of early prevention and intervention.

Internalizing problems, including depression, anxiety, social withdrawal, and somatic or physical problems (e.g., fears, concerns, headaches, and stomachaches; Merrell, 2008; Plenty et al., 2014), constitute an important negative aspect of mental health. Research conducted in several Western countries (e.g., Scandinavian countries, the United Kingdom, and the United States) has shown that the prevalence of internalizing problems among adolescents has increased in the past decade (Bor et al., 2014; Kassebaum et al., 2017; Potrebny et al., 2017; Thorisdottir et al., 2017; Wiens et al., 2020). In the Netherlands, almost one in five adolescents reported internalizing problems in 2019 (Nederlands Jeugd Instituut, 2022), representing a slight increase since 2013 (Van Bon-Martens et al., 2020; Kleinjan et al., 2020).

Another important component of mental health is the positive aspect of well-being, which encompasses happiness, positive emotions, satisfaction with life, and good functioning in one's individual endeavors and social life (Diener, 2009; Gallagher et al., 2009). Similar to the increases in internalizing problems, multiple prevalence studies conducted in Europe and with global populations have demonstrated a decline in adolescent well-being (e.g., life satisfaction and happiness) in the past decade (Cosma et al., 2020; Inchley et al., 2020; Marquez & Long, 2021). Adolescents in the Netherlands have consistently reported some of the highest levels of well-being across Europe (Bi et al., 2021; Currie et al. 2012; Inchley et al. 2016); these levels also exceed those in other Western countries, such as Canada and the United States (Campbell et al., 2021; Cosma et al., 2020; De Looze et al., 2018). On average, more than 90% of 15-year-olds

in the Netherlands report high well-being (measured as life satisfaction; Inchley et al. 2016). Furthermore, trends in well-being in the Netherlands have been remarkably stable over time (e.g., adolescents' life satisfaction ratings were 7.7–7.8 between 2003 and 2015; Kleinjan et al., 2020). Yet, in line with the global findings, a recent decrease in well-being has been observed also in the Netherlands (e.g., Kleinjan et al., 2020). Dutch adolescents' life satisfaction ratings declined from 7.8 in 2015 to 7.5 in 2019 (Kleinjan et al., 2020), and other aspects of well-being, such as happiness, have appeared to decline as well (e.g., Maciejewski et al., 2015). Thus, the typically high well-being of Dutch adolescents is currently at risk, and insight into possibilities for the protection and promotion of adolescent well-being is of great relevance.

Both adolescent well-being and internalizing problems have been further harmed by the coronavirus disease 19 (COVID-19) pandemic, and the measures implemented to protect against it. Especially lockdown measures, including long-term school closures, quarantines, and social distancing, have taken their toll on adolescent mental health (Houghton et al., 2022; Van de Bongardt & Peer Relations Researchers network, 2020). Indeed, since the pandemic, adolescent well-being has declined even further while internalizing problems increased even more worldwide, including in the Netherlands (Munasinghe et al., 2020; Van der Laan et al., 2021; Von Soest et al., 2020; Zolopa et al., 2022).

Well-being and internalizing problems

Although well-being and internalizing problems are both important parts of mental health, for our understanding of adolescent mental health, it is important to realize that they are not the same. However, the concept of well-being is often used interchangeably with mental health problems, particularly internalizing problems, in the literature. According to the dual-continuum model (Keyes, 2005), mental health problems (e.g., internalizing problems) and well-being lie on parallel continua, rather than being at opposite ends of a single continuum. This model holds that the experience of internalizing problems can interfere with well-being, but that this relationship is not of a one-to-one nature: theoretically, adolescents who experience internalizing problems may have relatively high levels of well-being, and vice versa (Keyes, 2002; Suldo et al., 2011). Empirical research has validated the dual-continuum model (e.g., Keyes, 2006; Keyes et al., 2012; Lamers et al., 2011; Renshaw & Cohen, 2014) and demonstrated the relevance of studying both internalizing problems and well-being to gain a more holistic view of adolescents' overall mental health (Boer et al., 2020; Fardouly et al., 2018; Patalay & Fitzsimons, 2018; Petropoulos Petalas et al., 2021).

To increase our understanding of well-being and internalizing problems within the dual-continuum framework, the research conducted for this dissertation used two approaches. In the first approach, the direct relationship between adolescents' internalizing problems and well-being was assessed cross-sectionally and over-time to test the hypothesis that internalizing problems may be a direct risk factor for adolescents' well-being. In the second approach, well-being and internalizing problems were examined as separate but complementary mental health outcomes while examining the links with relevant psychosocial factors, including relationships with parents and peers.

Conceptualization and operationalization of well-being

The conceptualization and operationalization of well-being have traditionally been surrounded by debate. Historically, well-being was treated as either a hedonic (e.g., happiness, positive affect, low negative affect, and satisfaction with life) or eudaimonic (e.g., optimal functioning in one's individual endeavors and social life) concept (for a review, see Ryan & Deci, 2001). Since the beginning of this century, however, well-being has been commonly recognized as a multidimensional construct with emotional, psychological, and social aspects encompassing both of these conceptions (Diener, 2009; Gallagher et al., 2009).

Although many instruments have been developed to assess adolescents' well-being, most are quite lengthy (for a review, see Rose et al., 2017) or measure only one or a few dimensions of well-being (for reviews, see Cooke et al., 2016; Linton et al., 2016). The 14-item Mental Health Continuum-Short Form (MHC-SF) is used frequently to assess multiple dimensions of well-being, including emotional, psychological, and social dimensions. It has been shown to have good psychometric properties with adolescent and adult samples in various cultural contexts, including populations in Argentina (Perugini et al., 2017), China (Guo et al., 2015), India (Singh et al., 2015), Italy (Petrillo et al., 2015), and the United States (Keyes, 2006). In the Netherlands, the MHC-SF had been validated for use with adults (Lamers et al., 2011); however, prior to the present research, no validated Dutch version of this questionnaire was available for adolescents. Thus, the first step of this dissertation research was to evaluate the psychometric properties of the MHC-SF with a sample of Dutch adolescents.

Adolescent mental health and the roles of relationships with parents and friends

In the research conducted for this dissertation, adolescent mental health was viewed from a psychosocial perspective (Reith-Hall, 2019). This perspective states that for our understanding of adolescent mental health, it is paramount to focus on the interplay

between adolescents' psychological/internal and social/external worlds (Reith-Hall, 2019). Thus, adolescents' well-being and internalizing problems were considered to be outcomes of continuous interactions between individual and social determinants.

Social relationships comprise an essential component of contemporary psychosocial perspectives (Reith-Hall, 2019). Theoretically and empirically, scholars have increasingly acknowledged that social relationships, and especially adolescents' perceptions of the quality of their social relationships, contribute significantly to the processes through which adolescents realize their well-being (Kesebir & Diener, 2009; Laursen & Collins, 2009). The present research focused on the quality of adolescents' most proximal relationships: those with their parents and close friends (for a review, see Smetana et al., 2006), and included both positive (e.g., level of warmth) and negative (e.g., level of conflict) aspects of these relationships (Furman & Buhrmester, 2009).

Adolescents' relationships with their parents transform significantly as they begin to develop autonomy from their families (Kenny et al., 2013; Seiffge-Krenke et al., 2010). Nonetheless, parents remain key resources for adolescents' psychosocial functioning and successful transition to adulthood (Boutelle et al., 2009; Shek et al., 2021). The quality of adolescents' relationships with their parents has been studied in relation to different aspects of adolescents' mental health, including depressive symptoms (Branje et al., 2010) and life satisfaction (Yucel & Yuan, 2016). For instance, adolescents with higher-quality relationships with their parents were found to report fewer depressive symptoms and higher life satisfaction than were those with lower-quality relationships (Branje et al., 2010; Yucel & Yuan, 2016). However, little is known about what role parent–adolescent relationship quality plays in the relationship between adolescents' internalizing problems and well-being.

Relative to preceding developmental stages, adolescents spend less time with their parents and more time with peers, increasingly forming emotional bonds and deeper attachments. Among the various types of adolescents' peer relationships, close friendships are considered to be the most important (La Greca & Harrison, 2005; Rubin et al., 2004). They are distinguished from general friendships, characterized by reciprocal disclosure, similarities in life stages and interests, and the sharing of activities, by secret sharing and intimacy (Finkenauer & Righetti, 2011; Way, 2013). The quality of such close friendships is one of the most important aspects of friendship development in adolescence, being of greater relevance than the number of friends (Berndt, 2002; Tipton et al., 2013). In empirical studies, adolescents with higher-quality close friendships reported higher well-being, measured as life satisfaction (Raboteg-Šarić &

Šakić, 2014) and happiness (Demir & Ozdemir, 2010), and fewer internalizing problems (Schwartz-Mette et al., 2020) than did those with lower-quality close friendships. Thus far, however, it remains largely unknown what role friendship quality plays in the relationship between adolescents' internalizing problems and well-being, or linked to well-being and internalizing problems as separate but complementary mental health outcomes.

As adolescents develop through continuous interactions with multiple social actors, including their parents (mothers and fathers) and close friends, the simultaneous investigation of such actors is needed (Bronfenbrenner & Morris, 2006). Researchers have increasingly examined the associations between various aspects of adolescents' relationships with parents and peers and their mental health (e.g., Hartas, 2021; Raboteg-Šarić & Šakić, 2014). For instance, a recent study revealed that close friendship quality was a significantly better predictor of mental health–related outcomes (e.g., internalizing problems) than the quality of parent–adolescent relationships (Allen et al., 2021). However, knowledge is limited on the separate roles of parent–adolescent relationship quality and friendship quality in the relationship between adolescents' internalizing problems and well-being or linked to well-being and internalizing problems as separate but complementary mental health outcomes, and even less is known about the unique roles of mothers, fathers, and close friends simultaneously regarding the interrelatedness between these two mental health aspects.

Focus on the quality of relationships with parents and close friends

Unique (buffering) roles of mothers and fathers

Most studies on the role of parent–adolescent relationship quality in adolescents' mental health have not distinguished between adolescents' relationships with their mothers and those with their fathers, implying that these relationships are interchangeable (Cabrera et al., 2014; Flouri, 2010). However, in line with family systems theory (e.g., Cox & Paley, 1997), increasing evidence indicates that mothers and fathers play unique roles in the development of children and adolescents, including their well-being. Mothers typically spend more time with adolescents than do fathers, and they are more likely to be involved in the daily care and communication about adolescents' social lives, school, and problems (Ebbert et al., 2018; Finley et al., 2008, Hawkins et al., 2006). Such gender differences suggest that the adolescent–mother relationships are more salient for adolescents' adjustment than is the adolescent–father relationship (Cortés-García et al., 2019; Van Lissa et al., 2019). However, findings on differences in the quality of these two relationships have been mixed. Whereas some studies have revealed no significant difference in positive qualities between mother– and father–adolescent relationships (De Goede et al., 2009; Lempers & Clark-Lempers, 1992), others have

shown that relationships between adolescents and their same-sex parents are of higher quality than are those with their opposite-sex parents (Branje et al., 2010; Shek, 2005; Zhang et al., 2021). In addition to these direct findings, the quality of relationships with parents have been argued theoretically to be resources that can help to reduce or buffer against adverse outcomes (e.g., lower well-being) among adolescents with heightened exposure to risk factors (e.g., internalizing problems). However, whether this argument applies to the roles of mothers and fathers in the association between adolescents' internalizing problems and well-being remained unknown. The research conducted for this dissertation built on existing research, with the examination of the quality of adolescents' relationships with their mothers and fathers in the association between internalizing problems and well-being and exploring their potentially unique buffering role.

Indirect effects via relationships with parents or friends

Internalizing problems may also be related to well-being in adolescents indirectly via interpersonal mechanisms, such as the quality of parent–adolescent relationships and friendships, as adolescents have continuous social interactions with their parents and close friends. Several studies of such indirect effects have indeed suggested that the quality of parent–adolescent relationships and friendships play explanatory roles in, for example, the relationships between relational aggression and social-psychological adjustment (Kamper & Ostrov, 2013) and the link between stressful life events and psychological distress (Dinizulu et al., 2014). However, to date, the association between adolescents' internalizing problems and well-being has been examined directly in cross-sectional and longitudinal research (Bartels et al., 2013; Lyons et al., 2013), thus focusing more on intrapersonal mechanisms. The current dissertation extends prior research by also examining the theoretical expectation that internalizing problems may be associated with adolescents' well-being indirectly through the quality of their relationships with their mothers, fathers, and close friends.

Close friends and social media use

With the increasing development of digital technology, adolescents spend large amounts of time on social media (e.g., WhatsApp, Facebook, Instagram, and Snapchat). For instance, about 95% of Dutch adolescents (aged 12–18 years) report such use (Centraal Bureau voor Statistiek, 2019), almost constantly throughout the day in almost one-third of cases (Stevens et al., 2018). Accordingly, the ways in which adolescents establish and maintain (close) friendships are increasingly intertwined with their social media use, and consideration of the role of such use when examining the effects of friendship quality on adolescents' well-being and internalizing problems is important (Koo et al., 2015). Research on the associations between social media use and adolescents'

well-being and internalizing problems is increasingly being performed, but systematic reviews reveal little agreement on whether these effects are positive or negative (e.g., Seabrook et al., 2016). The research conducted for this dissertation contributed to the existing body of literature by investigating the simultaneous associations of friendship quality and social media use with adolescents' well-being and internalizing problems, concurrently and longitudinally.

Close friends and global self-esteem

As (close) friends become increasingly important during adolescence and these friendships may become the critical contexts in which adolescents realize their well-being, a better understanding of the mechanism underlying the association between higher-quality close friendships and higher well-being is needed. Social cognitive theory suggests that associations between social environmental factors and well-being are mediated by individual cognitive factors (Bandura, 2001). In the present research, global self-esteem was hypothesized to mediate the association between adolescents' friendship quality and well-being. Global self-esteem is defined as an individual's overall evaluation of his or her worth or value as a person (Harter, 1999), and has been linked positively to well-being (Joshanloo & Afshari, 2011; Yang et al., 2019) and adolescents' friendship quality (Bum & Jeon, 2016; Farineau et al., 2013; Thomas & Daubman, 2001). Building on these established relationships, previous cross-sectional studies have already shown a partial or full mediational role of global self-esteem in concurrent associations between adolescents' social support (of family, friends, and others) and different indicators of well-being (e.g., Aziz et al., 2021; Kong & You, 2013; Poudel et al., 2020; Tian et al., 2013). Although these cross-sectional findings are valuable, this dissertation performed longitudinal research for the first time, to assess whether these linkages persisted over time and affected adolescents' future well-being.

Gender differences in adolescent mental health

Although the recent worsening of adolescent mental health has been observed among both boys and girls, girls appear to be particularly at risk. Adolescent girls typically report lower average levels of well-being and more internalizing problems than do adolescent boys (Bartels et al., 2013; Stevens et al., 2018). Moreover, girls experience steeper declines in well-being and increases in internalizing problems, placing them at greater risk (Henkens et al., 2022; Marquez & Long, 2021). Gender differences in average scores representing other concepts of interest in the present research have also been observed; girls generally report higher-quality relationships with mothers, fathers, and close friends (Raboteg-Šarić & Šakić, 2014; Schwartz-Mette et al., 2020; Van Eijck et al., 2012); more frequent social media use (Kelly et al., 2018); and lower global self-esteem (Way et al., 2007) than do boys. Thus, the question arises of whether the links

between these concepts, and the underlying mechanisms, also differ between boys and girls. Relative to boys, girls are typically socialized to value social relationships more (You et al., 2018) and are more sensitive to social influences (Cialdini & Trost, 1998; Rudolph & Conley, 2005). For instance, friendship quality has been found to be more important for girls' than for boys' psychological well-being (Almquist et al., 2014). Thus, gender-based similarities and differences in the effects of psychosocial factors on (the development of) mental health were examined in the present research. The findings provide valuable input for the development of more gender-sensitive prevention and intervention strategies for the improvement of adolescent mental health.

Research questions

The main aim of the research conducted for this dissertation was to better understand potential risk and protective factors associated with adolescents' mental health from a psychosocial perspective, by examining the interplay between individual factors and social relationships (with parents and friends) and their linkages with adolescents' well-being and internalizing problems. To meet the initial requirement for the adequate measurement of adolescents' well-being, a psychometric evaluation of the MHC-SF among Dutch adolescents was performed first. Subsequently, the direct and buffering effects of mother– and father–adolescent relationship quality, and the indirect effects via the quality of relationships with parents and close friends, regarding the association between adolescents' internalizing problems and well-being were examined. In addition, the roles of close friendship quality and social media use were studied in adolescents' internalizing problems and well-being, as separate but complementary mental health outcomes. Finally, global self-esteem was studied as a potential mechanism explaining the link between the quality of adolescents' close friendships and their well-being.

The following research questions were addressed:

1. What are the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF) in the measurement of multidimensional well-being among Dutch adolescents?
2. How are internalizing problems related concurrently to adolescent boys' and girls' well-being, and to what extent does the quality of adolescents' unique relationships with their mothers and fathers buffer this association?
3. How are internalizing problems related prospectively to adolescent boys' and girls' well-being, and to what extent are these internalizing problems indirectly related to well-being over-time via the quality of adolescents' unique relationships with their mothers, fathers, and close friends?

4. What are the direct and interacting effects of friendship quality and social media use in relation to adolescent boys' and girls' well-being and internalizing problems? To what extent do these effects apply to cross-sectional and longitudinal results?
5. How is friendship quality related to adolescent boys' and girls' well-being over time, and to what extent does global self-esteem explain this longitudinal link?

Study design

To examine the research questions posed in the five studies comprising this work, two waves of online self-report questionnaire data were collected in the classroom during regular school hours from a school-based sample of Dutch adolescents. The planned third wave of data collection was cancelled due to the COVID-19-related school closures. As a result, we have conducted the five studies presented in this dissertation to answer the research questions to the best of our ability with these rich two waves of data. The measurement occasions took place in the Spring of 2018 and 2019, separated by a one-year interval, both pre-pandemic. Therefore, an examination of the direct effects of the COVID-19 pandemic on adolescents' mental health falls outside of the scope of this research.

The total sample (the base sample described in Chapters 3–6) was drawn from three secondary schools that participated in both waves and consisted of 1,304 adolescents (53.0% girls) aged 11–17 years [mean (*M*) = 13.8; standard deviation (*SD*) = 1.1] at baseline. In the first wave, data were collected from 1,124 adolescents (53.1% girls) aged 11–17 years (*M* = 13.7; *SD* = 1.1) in grades 7–9. In the second wave, data were collected from 1,055 adolescents (55.4% girls) aged 12–18 years (*M* = 14.6; *SD* = 1.1) in grades 7–10. The psychometric evaluation of the MHC-SF (described in Chapter 2) was performed with a larger sample (*n* = 1,175) that participated in the first wave, which included adolescents from a fourth school that participated only in this first wave, and withdrew from the study between wave 1 and 2.

Dissertation outline

The psychometric evaluation of the MHC-SF among Dutch adolescents, including the assessment of its factor structure, internal consistency, construct validity, and gender and age invariance (research question 1), is described in **Chapter 2**. The link between adolescents' internalizing problems and well-being is the focus of **Chapters 3 and 4**. Specifically, the cross-sectional study of the potential buffering role of mother– and father–adolescent relationship quality in the association between adolescents' internalizing problems and their well-being, and gender differences in these main and buffering effects (research question 2), is presented in **Chapter 3**. The investigation of the over-time association between adolescents' internalizing problems and well-being,

indirect effects via the quality of parent–adolescent relationships and close friendships, and gender differences therein (research question 3) is described in **Chapter 4**. A study of the simultaneous concurrent and longitudinal (direct and interacting) associations of friendship quality and social media use with adolescents' internalizing problems and well-being, and gender differences therein (research question 4), is presented in **Chapter 5**. The potential explanatory role of global self-esteem in the longitudinal link between adolescents' friendship quality and well-being, and gender differences in this association (research question 5), are described in **Chapter 6**. An overall discussion of the main findings, reflections on theoretical and methodological issues, consideration of the findings' implications for policy and practice, and recommendations for future research are presented in **Chapter 7**.

REFERENCES

Allen, J. P., Costello, M., Kansky, J., & Loeb, E. L. (2022). When friendships surpass parental relationships as predictors of long-term outcomes: Adolescent relationship qualities and adult psychosocial functioning. *Child Development, 93*(3), 760-777. https://doi.org/10.1111/cdev.13713

Almquist, Y. B., Östberg, V., Rostila, M., Edling, C., & Rydgren, J. (2014). Friendship network characteristics and psychological well-being in late adolescence: exploring differences by gender and gender composition. *Scandinavian Journal of Public Health, 42*(2), 146-154. https://doi.org/10.1177/1403494813510793

Aziz, M., Khan, W., Amin, F., & Khan, M. F. (2021). Influence of Parenting Styles and Peer Attachment on Life Satisfaction Among Adolescents: Mediating Role of Self-Esteem. *The Family Journal*, 1-11. https://doi.org/10.1177%2F10664807211009807

Bartels, M., Cacioppo, J. T., Van Beijsterveldt, T. C., & Boomsma, D. I. (2013). Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetics, 43*(3), 177-190. https://doi.org/10.1007/s10519-013-9589-7

Berndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychological Science, 11*(1), 7-10. https://doi.org/10.1111/1467-8721.00157

Bi, S., Stevens, G. W., Maes, M., Boer, M., Delaruelle, K., Eriksson, C., ... & Finkenauer, C. (2021). Perceived social support from different sources and adolescent life satisfaction across 42 countries/regions: The moderating role of national-level generalized trust. *Journal of Youth and Adolescence, 50*(7), 1384-1409. https://doi.org/10.1007/s10964-021-01441-z

Boer, M., Stevens, G. W., Finkenauer, C., de Looze, M. E., & van den Eijnden, R. J. (2020). Social Media Use Intensity, Social Media Use Problems, and Mental Health among Adolescents: Investigating Directionality and Mediating Processes. *Computers in Human Behavior, 116*, Article 106645. https://doi.org/10.1016/j.chb.2020.106645

Bor, W., Dean, A. J., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal of Psychiatry, 48*(7), 606-616. https://doi.org/10.1177/0004867414533834

Boutelle, K., Eisenberg, M. E., Gregory, M. L., & Neumark-Sztainer, D. (2009). The reciprocal relationship between parent–child connectedness and adolescent emotional functioning over 5 years. *Journal of Psychosomatic Research, 66*(4), 309-316. https://doi.org/10.1016/j.jpsychores.2008.10.019

Branje, S. J., Hale, W. W., Frijns, T., & Meeus, W. H. (2010). Longitudinal associations between perceived parent–child relationship quality and depressive symptoms in adolescence. *Journal of Abnormal Child Psychology, 38*(6), 751-763. https://doi.org/10.1007/s10802-010-9401-6

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In: W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Volume 1: Theoretical models of human development*, 6th ed. New York: Wiley, pp.793-828.

Bum, C. H., & Jeon, I. K. (2016). Structural relationships between students' social support and self-esteem, depression, and happiness. *Social Behavior and Personality: an International Journal, 44*(11), 1761-1774. https://doi.org/10.2224/sbp.2016.44.11.1761

Cabrera, N. J., Fitzgerald, H. E., Bradley, R. H., & Roggman, L. (2014). The ecology of father-child relationships: An expanded model. *Journal of Family Theory & Review, 6*(4), 336-354. https://doi.org/10.1111/jftr.12054

Campbell, O. L., Bann, D., & Patalay, P. (2021). The gender gap in adolescent mental health: a cross-national investigation of 566,829 adolescents across 73 countries. *SSM -Population Health*, *13*, 100742. https://doi.org/10.1016/j.ssmph.2021.100742

Centraal Bureau voor de Statistiek (2019). Internetgebruik onder jongeren. Retrieved September 12, 2020, from: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83429ned/table?fromstatweb

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, 4th ed., pp. 151-192). Oxford University Press.

Cooke, P. J., Melchert, T. P., & Connor, K. (2016). Measuring well-being: A review of instruments. *The Counseling Psychologist*, *44*(5), 730-757. https://doi.org/10.1177/0011000016633507

Cosma, A., Stevens, G., Martin, G., Duinhof, E. L., Walsh, S. D., Garcia-Moya, I., ... & De Looze, M. (2020). Cross-national time trends in adolescent mental well-being from 2002 to 2018 and the explanatory role of schoolwork pressure. *Journal of Adolescent Health*, *66*(6), S50-S58. https://doi.org/10.1016/j.jadohealth.2020.02.010

Cortés-García, L., Wichstrøm, L., Viddal, K. R., & Senra, C. (2019). Prospective bidirectional associations between attachment and depressive symptoms from middle childhood to adolescence. *Journal of Youth and Adolescence*, *48*(11), 2099-2113. https://doi.org/10.1007/s10964-019-01081-4

Costello, E. J., Copeland, W., & Angold, A. (2011). Trends in psychopathology across the adolescent years: what changes when children become adolescents, and when adolescents become adults?. *Journal of Child Psychology and Psychiatry*, *52*(10), 1015-1025. https://doi.org/10.1111/j.1469-7610.2011.02446.x

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, *48*(1), 243-267. https://doi.org/10.1146/annurev.psych.48.1.243

Currie, C. et al. (Eds.) (2012). Social determinants of health and well-being among young people: Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/10 survey. Copenhagen, Denmark: WHO Regional Office for Europe.

De Goede, I. H., Branje, S. J., & Meeus, W. H. (2009). Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth and Adolescence*, *38*(1), 75-88. https://doi.org/10.1007/s10964-008-9286-7

De Looze, M. E., Huijts, T., Stevens, G. W., Torsheim, T., & Vollebergh, W. A. (2018). The happiest kids on earth. Gender equality and adolescent life satisfaction in Europe and North America. *Journal of Youth and Adolescence*, *47*(5), 1073-1085. https://doi.org/10.1007/s10964-017-0756-7

Demir, M., & Özdemir, M. (2010). Friendship, need satisfaction and happiness. *Journal of Happiness Studies*, *11*(2), 243–259. https://doi.org/10.1007/s10902-009-9138-5.

Diener, E. (2009). Subjective well-being. In: E. Diener (Ed.), *The science of well-being* (pp. 11-58). Social Indicators Research Series, vol 37. Dordrecht: Springer.

Dinizulu, S. M., Grant, K. E., Bryant, F. B., Boustani, M. M., Tyler, D., & McIntosh, J. M. (2014). Parent–Adolescent Relationship Quality and Nondisclosure as Mediators of the Association Between Exposure to Community Violence and Psychological Distress. *Child Youth Care Forum*, *43*, 41-61. https://doi.org/10.1007/s10566-013-9224-z

Ebbert, A. M., Infurna, F. J., & Luthar, S. S. (2019). Mapping developmental changes in perceived parent–adolescent relationship quality throughout middle school and high school.

Development and Psychopathology, *31*(4), 1541-1556. https://doi.org/10.1017/S0954579418001219

Fardouly, J., Magson, N. R., Johnco, C. J., Oar, E. L., & Rapee, R. M. (2018). Parental control of the time preadolescents spend on social media: Links with preadolescents' social media appearance comparisons and mental health. *Journal of Youth and Adolescence*, *47*(7), 1456-1468. https://doi.org/10.1007/s10964-018-0870-1

Farineau, H. M., Stevenson Wojciak, A., & McWey, L. M. (2013). You matter to me: important relationships and self-esteem of adolescents in foster care. *Child & Family Social Work*, *18*(2), 129-138. https://doi.org/10.1111/j.1365-2206.2011.00808.x

Finkenauer, C., & Righetti, F. (2011). Understanding in close relationships: An interpersonal approach. *European Review of Social Psychology*, *22*(1), 316-363. https://doi.org/10.1080/10463283.2011.633384

Finley, G. E., Mira, S. D., & Schwartz, S. J. (2008). Perceived paternal and maternal involvement: Factor structures, mean differences, and parental roles. *Fathering*, *6*(1), 62-82. https://doi.org/10.3149/fth.0601.62

Flouri, E. (2010). Fathers' behaviors and children's psychopathology. *Clinical Psychology Review*, *30*(3), 363-369. https://doi.org/10.1016/j.cpr.2010.01.004

Furman, W., & Buhrmester, D. (2009). Methods and measures: The network of relationships inventory: Behavioral systems version. *International Journal of Behavioral Development*, *33*(5), 470-478. https://doi.org/10.1177%2F0165025409342634

Gallagher, M. W., Lopez, S. J., & Preacher, K. J. (2009). The hierarchical structure of well-being. *Journal of Personality*, *77*(4), 1025-1050. https://doi.org/10.1111/j.1467-6494.2009.00573.x

Gray, S. L., Culpepper, C. L., & Welsh, D. P. (2012). Adolescence. In V. S. Ramachandran, *Encyclopedia of Human Behavior* (Second Edition) (pp. 22-29). Academic Press. https://doi.org/10.1016/B978-0-12-375000-6.00003-3

Guo, C., Tomson, G., Guo, J., Li, X., Keller, C., & Söderqvist, F. (2015). Psychometric evaluation of the Mental Health Continuum-Short Form (MHC-SF) in Chinese adolescents–a methodological study. *Health and Quality of Life Outcomes*, *13*(1), 198. https://doi.org/10.1186/s12955-015-0394-2

Hartas, D. (2021). The social context of adolescent mental health and wellbeing: Parents, friends and social media. *Research Papers in Education*, *36*(5), 542-560. https://doi.org/10.1080/02671522.2019.1697734

Hawkins, D. N., Amato, P. R., & King, V. (2006). Parent-adolescent involvement: The relative influence of parent gender and residence. *Journal of Marriage and Family*, *68*(1), 125-136. https://doi.org/10.1111/j.1741-3737.2006.00238.x

Henkens, J. H., Kalmijn, M., & de Valk, H. A. (2022). Life Satisfaction Development in the Transition to Adulthood: Differences by Gender and Immigrant Background. *Journal of Youth and Adolescence*, *51*(2), 305-319. https://doi.org/10.1007/s10964-021-01560-7

Houghton, S., Kyron, M., Hunter, S. C., Lawrence, D., Hattie, J., Carroll, A., & Zadow, C. (2022). Adolescents' longitudinal trajectories of mental health and loneliness: The impact of COVID-19 school closures. *Journal of Adolescence*, *94*(2), 191-205. https://doi.org/10.1002/jad.12017

Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., Mathison, F., Aleman-Diaz, A., Molcho, M., Weber, M., & Barnekow, V. (2016). Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health Behaviour

in School-aged Children (HBSC) study: international report from the 2013/2014 survey. Copenhagen: WHO Regional Office for Europe.

Inchley, J., Currie, D., Budisavljevic, S., Torsheim, T., Jåstad, A., Cosma, A., Kelly, C., & Arnarsson, Á. M. (2020). Spotlight on adolescent health and well-being. Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada. International report. Volume 1. Key findings. Copenhagen: WHO Regional Office for Europe.

Joshanloo, M., & Afshari, S. (2011). Big five personality traits and self-esteem as predictors of life satisfaction in Iranian Muslim university students. *Journal of Happiness Studies*, *12*(1), 105-113. https://doi.org/10.1007/s10902-009-9177-y

Kamper, K. E., & Ostrov, J. M. (2013). Relational aggression in middle childhood predicting adolescent social-psychological adjustment: The role of friendship quality. *Journal of Clinical Child & Adolescent Psychology*, *42*(6), 855-862. https://doi.org/10.1080/15374416.2013.844595

Kassebaum, N., Kyu, H. H., Zoeckler, L., Olsen, H. E., Thomas, K., Pinho, C., ... & Meaney, P. A. (2017). Child and adolescent health from 1990 to 2015: findings from the global burden of diseases, injuries, and risk factors 2015 study. *JAMA pediatrics*, *171*(6), 573-592. https://doi.org/10.1001/jamapediatrics.2017.0250

Kelly, Y., Zilanawala, A., Booker, C., & Sacker, A. (2018). Social media use and adolescent mental health: Findings from the UK Millennium Cohort Study. *EClinicalMedicine*, *6*, 59-68. https://doi-org.eur.idm.oclc.org/10.1016/j.eclinm.2018.12.005

Kenny, R., Dooley, B., & Fitzgerald, A. (2013). Interpersonal relationships and emotional distress in adolescence. *Journal of Adolescence*, *36*(2), 351-360. https://doi.org/10.1016/j.adolescence.2012.12.005

Kesebir, P., & Diener, E. (2009). In pursuit of happiness: Empirical answers to philosophical questions. In E. Diener (Eds.), *The science of well-being*. Dordrecht: Springer, pp. 59-74.

Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, *43*(2), 207-222. https://doi.org/10.2307/3090197

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Keyes, C. L. (2006). The subjective well-being of America's youth: Toward a comprehensive assessment. *Adolescent & Family Health*, *4*(1), 3-11.

Keyes, C. L., Eisenberg, D., Perry, G. S., Dube, S. R., Kroenke, K., & Dhingra, S. S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American College Health*, *60*(2), 126-133. https://doi.org/10.1080/07448481.2011.608393

Kleinjan, M., Pieper, I., Stevens, G. W. J. M., Van de Klundert, N., Rombouts, M., Boer, M., & Lammers, J. (2020). Geluk onder druk?: Onderzoek naar het mentaal welbevinden van jongeren in Nederland. Den Haag. Retrieved May 10, 2022, from https://www.trimbos.nl/wp-content/uploads/sites/31/2021/09/af1785-geluk-onder-druk.pdf

Kong, F., You, X. (2013). Loneliness and Self-Esteem as Mediators Between Social Support and Life Satisfaction in Late Adolescence. *Social Indicators Research*, *110*, 271-279. https://doi-org.eur.idm.oclc.org/10.1007/s11205-011-9930-6

Koo, H. J., Woo, S., Yang, E., & Kwon, J. H. (2015). The double meaning of online social space: Three-way interactions among social anxiety, online social behavior, and offline social behavior. *Cyberpsychology, Behavior, and Social Networking*, *18*(9), 514-520. https://doi.org/10.1089/cyber.2014.0396

La Greca, A. M., & Harrison, H. M. (2005). Adolescent peer relations, friendships, and romantic relationships: Do they predict social anxiety and depression?. *Journal of Clinical Child and Adolescent Psychology*, *34*(1), 49-61. https://doi.org/10.1207/s15374424jccp3401_5

Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of Clinical Psychology*, *67*(1), 99-110. https://doi.org/10.1002/jclp.20741

Laursen, B., & Collins, W. A. (2009). Parent–child relationships during adolescence. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology: Contextual influences on adolescent development* (pp. 3–42). John Wiley & Sons, Inc. https://doi.org/10.1002/9780470479193.adlpsy002002

Lempers, J. D., & Clark-Lempers, D. S. (1992). Young, middle, and late adolescents' comparisons of the functional importance of five significant relationships. *Journal of Youth and Adolescence*, *21*(1), 53-96. https://doi.org/10.1007/BF01536983

Linton, M. J., Dieppe, P., & Medina-Lara, A. (2016). Review of 99 self-report measures for assessing well-being in adults: exploring dimensions of well-being and developments over time. *BMJ Open*, *6*(7), e010641. http://dx.doi.org/10.1136/bmjopen-2015-010641

Lyons, M. D., Huebner, E. S., Hills, K. J., & Van Horn, M. L. (2013). Mechanisms of change in adolescent life satisfaction: A longitudinal analysis. *Journal of School Psychology*, *51*(5), 587-598. https://doi.org/10.1016/j.jsp.2013.07.001

Maciejewski, D. F., van Lier, P. A., Branje, S. J., Meeus, W. H., & Koot, H. M. (2015). A 5-year longitudinal study on mood variability across adolescence using daily diaries. *Child Development*, *86*(6), 1908-1921. https://doi.org/10.1111/cdev.12420

Marquez, J., & Long, E. (2021). A global decline in adolescents' subjective well-being: a comparative study exploring patterns of change in the life satisfaction of 15-year-old students in 46 countries. *Child Indicators Research*, *14*(3), 1251-1292. https://doi.org/10.1007/s12187-020-09788-8

Merrell, K. W. (2008). Understanding internalizing problems: Depression and anxiety in children and adolescents. In K. W. Merrel, *Helping students overcome depression and anxiety, second edition: A practical guide* (pp. 1-18). New York: The Guilford Press.

Munasinghe, S., Sperandei, S., Freebairn, L., Conroy, E., Jani, H., Marjanovic, S., & Page, A. (2020). The impact of physical distancing policies during the COVID-19 pandemic on health and well-being among Australian adolescents. *Journal of Adolescent Health*, *67*(5), 653-661. https://doi.org/10.1016/j.jadohealth.2020.08.008

Nederlands Jeugd Instituut. (2022). Cijfers over welbevinden en mentale gezondheid. Retrieved April 17, 2022 from: https://www.nji.nl/cijfers/welbevinden

Otto, C., Reiss, F., Voss, C., Wüstner, A., Meyrose, A. K., Hölling, H., & Ravens-Sieberer, U. (2021). Mental health and well-being from childhood to adulthood: design, methods and results of the 11-year follow-up of the BELLA study. *European Child & Adolescent Psychiatry*, *30*(10), 1559-1577. https://doi.org/10.1007/s00787-020-01630-4

Parkin, E., Long, R., & Gheera, M. (2019). Children and young people's mental health: policy, services, funding and education (No. 07196). House of Commons Library. Retrieved September 10, 2020 from: https://dera.ioe.ac.uk/30819/1/CBP-7196%20_Redacted.pdf

Patalay, P., & Fitzsimons, E. (2018). Development and predictors of mental ill-health and wellbeing from childhood to adolescence. *Social Psychiatry and Psychiatric Epidemiology*, *53*(12), 1311-1323. https://doi.org/10.1007/s00127-018-1604-0

Perugini, M. L. L., de la Iglesia, G., Solano, A. C., & Keyes, C. L. M. (2017). The mental health continuum–short form (MHC–SF) in the Argentinean context: Confirmatory factor analysis and measurement invariance. *Europe's Journal of Psychology*, *13*(1), 93-108. https://doi.org/10.5964/ejop.v13i1.1163

Petrillo, G., Capone, V., Caso, D., & Keyes, C. L. (2015). The Mental Health Continuum–Short Form (MHC–SF) as a measure of well-being in the Italian context. *Social Indicators Research*, *121*(1), 291-312. https://doi.org/10.1007/s11205-014-0629-3

Petropoulos Petalas, D., Konijn, E. A., Johnson, B. K., Veldhuis, J., Bij de Vaate, N. A., Burgers, C., ... & van de Schoot, R. (2021). Plurality in the Measurement of Social Media Use and Mental Health: An Exploratory Study Among Adolescents and Young Adults. *Social Media + Society*, *7*(3), 1-19. https://doi-org.eur.idm.oclc.org/10.1177%2F20563051211035353

Plenty, S., Östberg, V., Almquist, Y. B., Augustine, L., & Modin, B. (2014). Psychosocial working conditions: An analysis of emotional symptoms and conduct problems amongst adolescent students. *Journal of Adolescence*, *37*(4), 407-417. https://doi.org/10.1016/j.adolescence.2014.03.008

Potrebny, T., Wiium, N., & Lundegård, M. M. I. (2017). Temporal trends in adolescents' self-reported psychosomatic health complaints from 1980-2016: A systematic review and meta-analysis. *PLOS One*, *12*(11), e0188374. https://doi.org/10.1371/journal.pone.0188374

Poudel, A., Gurung, B., & Khanal, G. P. (2020). Perceived social support and psychological wellbeing among Nepalese adolescents: the mediating role of self-esteem. *BMC Psychology*, *8*(1), 1-8. https://doi.org/10.1186/s40359-020-00409-1

Raboteg-Šarić, Z., & Šakić, M. (2014). Relations of parenting styles and friendship quality to self-esteem, life satisfaction and happiness in adolescents. *Applied Research in Quality of Life*, *9*, 749-765. https://doi.org/10.1007/s11482-013-9268-0

Reith-Hall, E. (2019). Child and adolescent mental health: A psychosocial perspective. In M. Payne, & E. Reith-Hall (Eds.), *The Routledge Handbook of Social Work Theory* (pp. 405-413). Routledge. https://doi.org/10.4324/9781315211053

Renshaw, T. L., & Cohen, A. S. (2014). Life satisfaction as a distinguishing indicator of college student functioning: Further validation of the two-continua model of mental health. *Social Indicators Research*, *117*(1), 319-334. https://doi.org/10.1007/s11205-013-0342-7

Rose, T., Joe, S., Williams, A., Harris, R., Betz, G., & Stewart-Brown, S. (2017). Measuring mental wellbeing among adolescents: A systematic review of instruments. *Journal of Child and Family Studies*, *26*(9), 2349-2362. https://doi.org/10.1007/s10826-017-0754-0

Rubin, K. H., Dwyer, K. M., Booth-LaForce, C., Kim, A. H., Burgess, K. B., & Rose-Krasnor, L. (2004). Attachment, friendship, and psychosocial functioning in early adolescence. *The Journal of early Adolescence*, *24*(4), 326-356. https://doi.org/10.1177/0272431604268530

Rudolph, K. D., & Conley, C. S. (2005). The socioemotional costs and benefits of social-evaluative concerns: Do girls care too much?. *Journal of Personality*, *73*(1), 115-138. https://doi.org/10.1111/j.1467-6494.2004.00306.x

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141-166. https://doi.prg/10.1146/annurev.psych.52.1.141

Sawyer, S. M., Afifi, R. A., Bearinger, L. H., Blakemore, S. J., Dick, B., Ezeh, A. C., & Patton, G. C. (2012). Adolescence: a foundation for future health. *The Lancet*, *379*(9826), 1630-1640. https://doi.org/10.1016/S0140-6736(12)60072-5

Schwartz-Mette, R. A., Shankman, J., Dueweke, A. R., Borowski, S., & Rose, A. J. (2020). Relations of friendship experiences with depressive symptoms and loneliness in childhood and adolescence: A meta-analytic review. *Psychological Bulletin, 146*(8), 664-700. https://doi.org/10.1037/bul0000239

Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: a systematic review. *JMIR Mental Health, 3*(4), e50. http://dx.doi.org/10.2196/mental.5842

Seiffge-Krenke, I., Overbeek, G., & Vermulst, A. (2010). Parent–child relationship trajectories during adolescence: Longitudinal associations with romantic outcomes in emerging adulthood. *Journal of Adolescence, 33*(1), 159-171. https://doi.org/10.1016/j.adolescence.2009.04.001

Shek, D. T. (2005). Perceived parental control and parent–child relational qualities in Chinese adolescents in Hong Kong. *Sex Roles, 53*(9), 635-646. https://doi.org/10.1007/s11199-005-7730-7

Shek, D. T., Lin, L., Ma, C., Yu, L., Leung, J. T., Wu, F. K., ... & Dou, D. (2021). Perceptions of adolescents, teachers and parents of life skills education and life skills in high school students in Hong Kong. *Applied Research in Quality of Life, 16*(5), 1847-1860. https://doi.org/10.1007/s11482-020-09848-9

Singh, K., Bassi, M., Junnarkar, M., & Negri, L. (2015). Mental health and psychosocial functioning in adolescence: An investigation among Indian students from Delhi. *Journal of Adolescence, 39*, 59-69. https://doi.org/10.1016/j.adolescence.2014.12.008

Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., ... & Fusar-Poli, P. (2022). Age at onset of mental disorders worldwide: large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry, 27*(1), 281-295. https://doi.org/10.1038/s41380-021-01161-7

Smetana, J. G., Campione-Barr, N., & Metzger, A. (2006). Adolescent development in interpersonal and societal contexts. *Annual Review of Psychology, 57*, 255-284. https://doi.org/10.1146/annurev.psych.57.102904.190124

Stevens, G. W. J. M., Van Dorsselaer, S., Boer, M., de Roos, S., Duinhof, E. L., ter Bogt, T. F. M., ... & de Looze, M. (2018). HBSC 2017. Gezondheid en welzijn van jongeren in Nederland. Retrieved May 15, 2020, from: https://hbsc-nederland.nl/wp-content/uploads/2018/09/Rapport-HBSC-2017.pdf

Suldo, S., Thalji, A., & Ferron, J. (2011). Longitudinal academic outcomes predicted by early adolescents' subjective well-being, psychopathology, and mental health status yielded from a dual factor model. *The Journal of Positive Psychology, 6*(1), 17-30. https://doi.org/10.1080/17439760.2010.536774

Thomas, J. J., & Daubman, K. A. (2001). The relationship between friendship quality and self-esteem in adolescent girls and boys. *Sex Roles, 45*(1), 53-65. https://doi.org/10.1023/A:1013060317766

Thorisdottir, I. E., Asgeirsdottir, B. B., Sigurvinsdottir, R., Allegrante, J. P., & Sigfusdottir, I. D. (2017). The increase in symptoms of anxiety and depressed mood among Icelandic adolescents: time trend between 2006 and 2016. *The European Journal of Public Health, 27*(5), 856-861. https://doi.org/10.1093/eurpub/ckx111

Tian, L., Liu, B., Huang, S., & Huebner, E. S. (2013). Perceived social support and school well-being among Chinese early and middle adolescents: The mediational role of self-esteem. *Social Indicators Research, 113*(3), 991-1008. https://doi.org/10.1007/s11205-012-0123-8

Tipton, L. A., Christensen, L., & Blacher, J. (2013). Friendship quality in adolescents with and without an intellectual disability. *Journal of Applied Research in Intellectual Disabilities*, *26*(6), 522-532. https://doi.org/10.1111/jar.12051

Van Bon-Martens, M., de Looze, M. E., van Dorsselaer, S., Vonk, R., & Stevens, G. W. J. M. (2020). Trends in emotioneel welbevinden van jongeren: De rol van ervaren schooldruk, communicatie met ouders en gepest worden Resultaten van het Nederlandse Health Behaviour in School-aged Children (HBSC) onderzoek 2005-2017. Retrieved from: https://www.trimbos.nl/wp-content/uploads/2021/11/AF1852-Trends-in-emotioneel-welbevinden-van-jongeren.pdf

Van de Bongardt, D. & Peer Relations Researchers network, PRR. (2020). Longread: Hoe gaat het met de peers? Over adolescenten en hun relaties met leeftijdgenoten in tijden van COVID-19. *Pedagogiek in Praktijk*, *116*, 36–41. Retrieved May 15, 2022, from http://hdl.handle.net/1765/131135

Van der Laan, S. E., Finkenauer, C., Lenters, V. C., Van Harmelen, A. L., van der Ent, C. K., & Nijhof, S. L. (2021). Gender-Specific Changes in Life Satisfaction After the COVID-19–Related Lockdown in Dutch Adolescents: A Longitudinal Study. *Journal of Adolescent Health*, *69*(5), 737-745. https://doi.org/10.1016/j.jadohealth.2021.07.013

Van Eijck, F. E., Branje, S. J., Hale, W. W., & Meeus, W. H. (2012). Longitudinal associations between perceived parent–adolescent attachment relationship quality and generalized anxiety disorder symptoms in adolescence. *Journal of Abnormal Child Psychology*, *40*(6), 871-883. https://doi.org/10.1007/s10802-012-9613-z

Van Lissa, C. J., Keizer, R., Van Lier, P. A. C., Meeus, W. H. J., & Branje, S. (2019). The role of fathers' versus mothers' parenting in emotion-regulation development from mid–late adolescence: Disentangling between-family differences from within-family effects. *Developmental Psychology*, *55*(2), 377–389. https://doi.org/10.1037/dev0000612

Von Soest, T., Bakken, A., Pedersen, W., & Sletten, M. A. (2020). Life satisfaction among adolescents before and during the COVID-19 pandemic. *Tidsskrift for Den norske legeforening*. https://doi.org/10.4045/tidsskr.20.0437

Way, N. (2013). Boys' friendships during adolescence: Intimacy, desire, and loss. *Journal of Research on Adolescence*, *23*(2), 201-213. https://doi.org/10.1111/jora.12047

Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: Associations with trajectories of psychological and behavioral adjustment. American *Journal of Community Psychology*, *40*, 194-213. https://doi.org/10.1007/s10464-007-9143-y

Wiens, K., Bhattarai, A., Pedram, P., Dores, A., Williams, J., Bulloch, A., & Patten, S. (2020). A growing need for youth mental health services in Canada: examining trends in youth mental health from 2011 to 2018. *Epidemiology and Psychiatric Sciences*, *29*, E115. https://doi.org/10.1017/S2045796020000281

World Health Organization. (2013). Mental health action plan 2013-2020. Retrieved June 1, 2020, from https://apps.who.int/iris/bitstream/handle/10665/89966/9789241506021_eng.pdf

Wykes, T., Bell, A., Carr, S., Coldham, T., Gilbody, S., Hotopf, M., ... & Creswell, C. (2021). Shared goals for mental health research: What, why and when for the 2020s. *Journal of Mental Health*, 1-9. https://doi.org/10.1080/09638237.2021.1898552

Yang, Q., Tian, L., Huebner, E. S., & Zhu, X. (2019). Relations among academic achievement, self-esteem, and subjective well-being in school among elementary school students: A longitudinal mediation model. *School Psychology*, *34*(3), 328-340. https://doi.org/10.1037/spq0000292

You, S., Lim, S. A., & Kim, E. K. (2018). Relationships between social support, internal assets, and life satisfaction in Korean adolescents. *Journal of Happiness Studies*, *19*(3), 897–915. https://doi-org.eur.idm.oclc.org/10.1007/s10902-017-9844-3.

Yucel, D., & Yuan, A. S. V. (2016). Parents, siblings, or friends? Exploring life satisfaction among early adolescents. *Applied Research in Quality of Life*, *11*(4), 1399-1423. https://doi.org/10.1007/s11482-015-9444-5

Zhang, Q., Pan, Y., Chen, Y., Liu, W., Wang, L., & Jean, J. A. (2021). Effects of Father–Adolescent and Mother–Adolescent Relationships on Depressive Symptoms among Chinese Early Adolescents. *Applied Research in Quality of Life*, 1-16. https://doi.org/10.1007/s11482-021-09997-5

Zolopa, C., Burack, J. A., O'Connor, R. M., Corran, C., Lai, J., Bomfim, E., ... & Wendt, D. C. (2022). Changes in youth mental health, psychological wellbeing, and substance use during the COVID-19 pandemic: A rapid review. *Adolescent Research Review*, 1-17. https://doi.org/10.1007/s40894-022-00185-6

2

Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF) in Dutch adolescents

This paper was published as:
Luijten, C. C., Kuppens, S., Van de Bongardt, D., & Nieboer, A. P. (2019). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Dutch adolescents. Health and Quality of Life Outcomes, 17(1), 157. https://doi.org/10.1186/s12955-019-1221-y

ABSTRACT

Background

Mental health is increasingly viewed as the presence of various aspects of well-being rather than just the absence of mental illness. The Mental Health Continuum-Short Form (MHC-SF) is a 14-item instrument that assesses mental health, focusing on emotional, psychological, and social well-being. The present study examined for the first time the psychometric properties of the Dutch version of the MHC-SF among adolescents, focusing on its factor structure, internal consistency, construct validity, and gender and age factorial invariance.

Methods

Data were collected from a school-based sample of 1,175 adolescents (53.4% girls) aged 11–17 years ($M = 13.7$; $SD = 1.1$). Participants completed an online questionnaire in the classroom during regular school hours. Statistical analyses to evaluate the factor structure, internal consistency, construct validity, and gender and age factorial invariance were performed in SPSS and R.

Results

Using confirmatory factor analyses, a satisfactory-to-good fit was obtained for the three-factor model (emotional, psychological, and social well-being). The MHC-SF scores showed good internal consistency (Cronbach's alpha = .91) and results supported convergent and divergent validity. Finally, the MHC-SF showed gender and age factorial invariance.

Conclusions

The current psychometric evaluation indicates the MHC-SF is a reliable and valid instrument to assess multiple dimensions of well-being among Dutch adolescents. The instrument can be applied for research purposes and in clinical practice.

INTRODUCTION

Although most adolescents in Western societies develop in a healthy and happy way (Inchley et al., 2016), adolescence remains a period of heightened vulnerability to the onset of mental illness (Paus et al., 2008). This vulnerability is related to the substantial physical, emotional, and social transformations that are characteristic of adolescence (Blakemore, 2008). This includes the physical and emotional changes associated with maturation, ever-increasing academic expectations, and changing social relationships with family members and peers (Inchley et al., 2016). Indeed, epidemiological studies of mental illness among adolescents have revealed adolescent mental illness prevalence rates ranging from 10 to 20% worldwide (Kieling et al., 2011), and a recent study showed that 10% of Dutch adolescents exhibited signs of mental illness, including mood disorders, anxiety, conduct problems, and substance disorders (Ormel et al., 2015).

Within the literature, mental health and its relation to mental illness have been approached from different perspectives. Traditionally, mental illness has been viewed from a pathology or deficit model, which conceives mental health as the absence of mental illness (Snyder & Lopez, 2002). However, the sole focus on treatment and prevention of mental illness has not succeeded in reducing the prevalence of mental illness in past decades (Insel & Solnick, 2006), nor has it prevented early age of onset for mood disorders, anxiety, and substance abuse disorders (Kessler et al., 2005). A recent meta-analysis revealed that the effectiveness of mental illness treatments for children and adolescents are often modest at best and that efforts to strengthen treatments have not resulted in improved effectiveness over the past five decades (Weisz et al., 2017). Moreover, adolescents with poor well-being in the absence of mental illness appear to be equally at risk for academic and behavior problems in school; performing no better than adolescents with a mental illness diagnosis and poor well-being (Antaramian et al., 2010).

Therefore, a more positive psychological approach is currently being advocated, which increases the focus on promoting and protecting well-being early in life rather than on preventing and treating deficits, like mental illness symptoms. In line with this approach, the World Health Organization (2004, p. 12) defines mental health as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community". According to this definition, mental health is not just the absence of mental illness, but rather reflects the presence of a state of well-being, encompassing life satisfaction, positive emotions, and good functioning in one's individual endeavors and social life.

There is a movement towards integrating symptoms with strengths and considering the balance of risks versus resources (Peterson & Seligman, 2004; Seligman, 2010). For example, Keyes (2005) developed a dual-continuum model, wherein mental illness and well-being are distinct, yet related, continua rather than opposite ends of a single continuum. As such, individuals with a mental illness can still experience high levels of well-being, whereas individuals without a mental illness can still experience low levels of well-being. Indeed, research has shown that an assessment that incorporates both well-being and mental illness symptoms in adolescents was a better predictor of psychosocial functioning, physical health, and school functioning than a unidimensional assessment that only considers mental illness symptoms (Suldo & Shaffer, 2008; Suldo et al., 2011).

The concept of well-being itself has also evolved. Historically, well-being has been approached through either a hedonic conception, focusing on, for instance, happiness, positive affect, low negative affect, and satisfaction with life (Bradburn, 1969; Diener, 1984) or a eudaimonic conception, comprising optimal functioning in one's individual endeavors and social life, such as positive psychological functioning and human development (Rogers, 1961; Ryff, 1989a, 1989b). The hedonic tradition is reflected in the conceptualization of emotional well-being in terms of perceptions of avowed happiness and satisfaction with life, and the balance of positive and negative affect over a period of time. It emphasizes the subjectivity of experience, including cognitive and affective evaluations of one's life as a whole (Diener, 2009; Kahneman et al., 1999). The eudaimonic tradition is reflected in the conceptualization of psychological and social well-being, with a focus on how well individuals see themselves functioning in life (e.g., purpose, personal growth, and positive relationships). Nowadays, well-being is commonly recognized as a multidimensional construct (Diener, 2009), encompassing emotional, psychological, and social well-being, thus, combining the hedonic and eudaimonic traditions (Gallagher et al., 2009).

Several instruments have been developed to assess adolescents' well-being, most of which are rather long or measure only one or a few dimensions of well-being. The 14-item Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2008) is a relatively brief questionnaire based on the 40-item Mental Health Continuum (Keyes, 2002). It addresses emotional, psychological, and social dimensions of well-being, and can be used to distinguish three levels of well-being: flourishing (i.e., high levels of well-being), moderate (i.e., neither flourishing nor languishing), and languishing (i.e., absence of well-being; Keyes, 2005). The MHC-SF has been shown to have good psychometric properties in both adolescents and adults within various cultural contexts, including Argentina (Perugini et al., 2017), Canada (Doré et al., 2017), China (Guo et al., 2015),

Egypt (Salama-Younes, 2011), India (Singh et al., 2015), Ireland (Donnelly et al., 2019), Italy (Petrillo et al., 2015), Korea (Lim, 2014), Poland (Karaś et al., 2014), South Africa (Keyes et al., 2008), and the USA (Keyes, 2006; Keyes et al., 2012). In the Netherlands, the MHC-SF has been validated for use with adults (Lamers et al., 2011), but there is not yet a validated Dutch version of the MHC-SF for adolescents.

Therefore, the aim of the present study was to evaluate the psychometric properties of the Dutch version of the MHC-SF in a school-based sample of adolescents. More specifically, the objectives were: 1) to test the factor structure; 2) to examine the internal consistency; 3) to assess the construct validity, including convergent and divergent validity indices; and 4) to examine gender and age invariance of the factor structure of the MHC-SF.

In light of prior findings in adolescent samples (Donnelly et al., 2019; Doré et al., 2017; Guo et al., 2015; Karaś et al., 2014; Lim, 2014; Salama-Younes, 2011; Singh et al., 2015) and Dutch adults (Lamers et al., 2011), the factor structure of the MHC-SF was expected to confirm the three-factor structure of emotional, psychological, and social well-being. Additionally, scores of the MHC-SF subscales were hypothesized to have an adequate internal consistency and the total scores were expected to correlate positively with other measures of well-being, thereby underpinning convergent validity (Donnelly et al., 2019; Guo et al., 2015; Karaś et al., 2014; Keyes, 2006; Lamers et al., 2011; Salama-Younes, 2011). More specifically, correlations were expected to be moderate-to-high because the dimensions of the MHC-SF subscales are similar, albeit not identical, to the validity measures (Guo et al., 2015). In contrast, the MHC-SF total scores were expected to correlate negatively with measures of mental illness symptoms thereby supporting divergent validity and the dual-continuum model (Doré et al., 2017; Guo et al., 2015; Karaś et al., 2014; Keyes, 2006; Salama-Younes, 2011). These correlations were expected to be low-to-moderate because they measure distinct, yet related continua, in line with the dual-continuum model perspective (Guo et al., 2015; Lamers et al., 2011). Finally, the emotional, psychological, and social well-being dimensions were expected to show measurement invariance across gender and age groups (Doré et al., 2017; Guo et al., 2015; Karaś et al., 2014).

METHODS

Sample

Adolescents from four secondary schools located in the areas of two large cities in the Netherlands (Amsterdam and Rotterdam) participated in the present study. The sample

consisted of 1,175 adolescents, including 374 7th graders (31.8%), 372 8th graders (31.7%), and 429 9th graders (36.5%) between 11.0 and 17.0 years old (M = 13.7, SD = 1.1). The sample included 53.4% (n = 627) girls. The Dutch secondary education system encompasses different levels, including pre-vocational education (VMBO), senior general education (HAVO), and pre-university education (VWO) tracks. Most of the participants (72.8%) were enrolled in the HAVO and VWO (higher education) tracks, compared to 27.2% who were enrolled in the VMBO (lower education) track.

Almost half of the participants (49.1%) had a Dutch ethno-cultural background (i.e., adolescents and their parents were born in the Netherlands), while 42.1% had a non-Western ethno-cultural background (i.e., being born or having at least one parent born in an African, Middle Eastern, Asian, or South-American country), and 8.5% had a non-Dutch Western ethno-cultural background (i.e., being born or having at least one parent born elsewhere in Europe or in the USA, Canada, Australia, or New Zealand). Almost three-quarters of the participants (72.8%) lived with both parents in the same household.

Procedure

Eligible schools in the Rotterdam and Amsterdam metropolitan areas were approached with an information letter and then contacted by phone and/or email one week later. Four schools provided active informed consent for their students' participation, after which 7th, 8th, and 9th graders and their parents received online information letters describing the aims and procedure of the study. Parents had the opportunity to decline their child's participation (passive informed consent) and adolescents were free to verbally decline participation at any the time during the study. In total, 5.8% of the parents and 0.4% of the adolescents declined participation.

Participants completed an online questionnaire in the classroom during regular school hours. Data collection was supervised by the lead researcher and several research assistants, who introduced the study and the procedure, answered questions, ensured maximum privacy, and guaranteed confidentiality of the responses. After completing the questionnaire, participants received small, non-financial incentives and a card with a list of websites to find more information about topics in the questionnaire (e.g., adolescent development, mental health) as well as the contact information of the research team to ask questions. After the data collection phase, one iPhone per school and one gift card per class (€5-€7.50 for 7th graders, €10 for 8th and 9th graders) were raffled.

The medical ethics committee of Erasmus Medical Centre, Rotterdam, the Netherlands determined that the rules stipulated in the Medical Research Involving Human Subjects Act did not apply to this study (protocol no. MEC-2018-055).

Measures

MHC-SF

We used the Dutch version of the MHC-SF (Keyes, 2005), which has previously been validated by Lamers et al. (2011) in an adult sample. The original English MHC-SF (Keyes et al., 2008) for adolescents is similar to the adult version, with only one adaptation to fit the adolescent population. In particular, examples of community in the item "How often did you feel that you belonged to a community?" were changed from "(like a social group, your neighborhood, or your city)" to "(like a group of friends, at school, or in the neighborhood)". In the present study, we used the same adaptation for adolescents in our Dutch version.

The MHC-SF (Keyes, 2005) consists of 14 items. Participants were instructed to think about the past month and rated the items on a 6-point scale (0 = never, 5 = every day). The items measure the degree of emotional well-being (items 1–3, e.g., "How often did you feel happy?") in terms of satisfaction with life and the balance between positive and negative affect; psychological well-being (items 9–14, e.g., "How often did you feel good at managing the responsibilities of your daily life?") based on Ryff's model (1989a, 1989b); and social well-being (items 4–8, e.g., "How often did you feel that you had something important to contribute to society?"), focusing on social acceptance, social actualization, social contribution, social coherence, and social integration (Keyes, 1998). Total sum scores on the MHC-SF can range from 0 to 70, with higher scores indicating higher levels of well-being.

The MHC-SF item scores were also used to distinguish three subgroups: flourishing, moderate, and languishing. In line with previous research, participants who answered "*every day*" or "*almost every day*" at least once in the emotional well-being scale and at least 6 times across 11 items measuring social and psychological well-being were diagnosed with *flourishing*. Participants who "*never*" or "*once or twice*" experienced for at least 1 item from the emotional well-being scale and at least 6 items on the social and/or psychological well-being scales were diagnosed with *languishing*. The respondents classified neither as flourishing nor as languishing are *moderately mentally healthy* (Keyes, 2005).

Other well-being measures

The participants completed four additional measures of well-being, including the Positive and Negative Affect Scale for Children (PANAS-C), the Kidscreen-27, the Social Production Function Instrument for the Level of well-being-short (SPF-ILs), and Cantril's ladder.

PANAS-C. The positive affect (PA) dimension of the 10-item PANAS-C (Ebesutani et al., 2012a) was selected to measure emotional well-being, as reflected by the extent to which a person feels enthusiastic and active. The PA dimension was assessed by five items: joyful, cheerful, happy, lively, and proud. Participants rated the frequency of PA emotions on a 5-point scale (1 = very little, 5 = a lot), which were summed to yield a total score. The PA dimension has been shown to measure PA markers well among 6–18-year-olds (Ebesutani et al., 2012a). In the present study, the Cronbach's alpha of the PANAS-C scores was .72.

Kidscreen-27. The Kidscreen-27 (Ravens-Sieberer et al., 2007; The Kidscreen Group Europe, 2006) is a well-being measure for young children and adolescents focused on life satisfaction, positive emotions, and feeling emotionally balanced. It consists of 27 items (e.g., "Has your life been enjoyable?"; "Have you had fun?"; "Have you felt so bad that you did not want to do anything?"). Participants were instructed to answer the questions in relation to the previous week on a 5-point Likert-type scale from 1 = poor to 5 = excellent; or from 1 = not at all to 5 = extremely; or from 1 = never to 5 = always. Four negatively formulated items were recoded according to standard procedures, after which the items were summed to yield a total score. The Kidscreen-27 has been validated with 8–18-year-olds in multiple countries, including the Netherlands (Ravens-Sieberer et al., 2007). The Cronbach's alpha for the Kidscreen-27 scores in the present study was .92.

SPF-ILs. The SPF-ILs (Nieboer et al., 2005) was used to assess the extent to which adolescents' needs for affection, behavioral confirmation, status, comfort, and stimulation are being met. This instrument was selected for validation purposes, because it measures overall well-being in terms of first-order goals that enable individuals to realize well-being. It consists of 15 items (e.g., "Do you really enjoy your activities?"; "Do you feel useful to others?"). Participants were instructed to think about the past months and rated the items on a 4-point scale (1 = never, 4 = always). Higher mean scores indicated higher levels of well-being. An adjusted version of the instrument is being used in the ongoing TRAILS (TRacking Adolescents' Individual Lives Survey) study of adolescents and has been shown to have good reliability (Verboom et al., 2014). In the present study, the Cronbach's alpha of the SPF-ILs scores was .86.

Cantril's ladder. Cantril's ladder (Cantril, 1965) was used to assess current life satisfaction and reflects a general, cognitive evaluation of a person's well-being. Respondents were asked with a single question to grade their lives on a scale from 0 to 10 with higher scores indicating higher levels of life satisfaction. Cantril's ladder is used worldwide and has been validated among adolescents in Scotland (Levin & Currie, 2014).

Mental illness symptoms measures

RCADS-25. Mental illness symptoms were assessed with the Revised Child Anxiety and Depression Scale-25 (RCADS-25; Ebesutani et al., 2012b). The RCADS-25 is a 25-item inventory with 10 items designed to measure depressive symptoms (e.g., "Nothing is much fun anymore") and 15 items designed to measure anxiety symptoms (e.g., "I worry about things"). The items follow a 4-point scale (0 = never, 3 = always), which are summed to yield a total score; with higher scores indicating more severe depression and anxiety. The RCADS-25 was developed for 8–18-year-old respondents and prior research supported internal consistency in a school-based and clinic-referred juvenile sample (Ebesutani et al., 2012b). In the present study, we obtained Cronbach's alphas of .85 for scores of the depressive symptoms subscale and .84 for the anxiety symptoms subscale.

Statistical analyses

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 (IBM Corporation, Armonk, NY, USA) and R (version 3.4.3; R Core Team) with the *lavaan* package (Rosseel, 2012). The significance level was set at 5.0% ($p < .05$).

The analyses were conducted in five steps. First, missing value analysis in SPSS indicated that 0.3–0.9% of the MHC-SF item scores were missing, largely as a consequence of the fact that not all participants fully completed the online questionnaire. Little's test showed that the values were missing completely at random, χ^2 (131) = 111.11, p = .895. Using the *lavaan* package, R works with full information maximum likelihood (FIML) and, thus, uses all available information.

Second, confirmatory factor analysis (CFA) was performed in R to assess the factor structure of the MHC-SF. Based on previous empirical research and theoretical considerations, three conceptual models were tested: 1) a single factor model representing general, global well-being; 2) a two-factor model comprising one latent factor representing hedonic (i.e., emotional) well-being and one factor representing eudaimonic (i.e., psychological and social) well-being; and 3) a three-factor model reflecting emotional, psychological, and social well-being. The CFA models were fitted by robust maximum likelihood (MLR) estimation because simulation studies have shown

that the relative bias in parameter estimates was generally negligible, regardless of the number of ordinal categories and the shape of the observed distributions (Lei, 2009; Oranje, 2003; Yang-Wallentin et al., 2010). MLR estimation provides a test statistic that is asymptotically equivalent to the Yuan-Bentler T2 test statistic (Yuan & Bentler, 2000) with standard errors that are robust against violations of multivariate normality.

Satorra-Bentler (SB) χ^2 tests were used to evaluate the absolute fit of the three models. However, because the SB χ^2 test is considered highly conservative, potentially leading to model rejection due to very small model misspecifications in large samples (Brown, 2006), the following alternative indices were also used to evaluate absolute model fit: root mean square error of approximation (RMSEA; Steiger & Lind, 1980), comparative fit index (CFI; Hu & Bentler, 1999), and standardized root mean square residual (SRMR; Hu & Bentler, 1999). Values of RSMEA < .06, CFI > .95, and SRMR ≤ .08 indicated a good model fit, whereas RSMEA < .08 and CFI > .90 indicated a satisfactory fit (Bentler & Bonett; 1980; Hu & Bentler, 1999). As we used MLR estimation, SB χ^2 tests were used to evaluate the absolute fit of the three models.

Third, Cronbach's alpha was used to examine the internal consistency of the MHC-SF in SPSS. A coefficient > .70 indicated good internal consistency (Nunnally & Bersntein, 1995). Fourth, Pearson correlations were used to examine the construct validity of the MHC-SF in terms of convergent validity relative to alternative measures of well-being (the PA scale of the PANAS-C, Kidscreen-27, SPF-ILs, and Cantril's ladder), as well as divergent validity relative to the RCADS-25 mental illness symptoms assessment tool. Correlations in the range of .10–.29 were considered low, those in the range of .30–.49 were considered moderate, and those ≥ .50 were considered high (Cohen, 1988).

In the fifth and final step, gender and age invariance of the best-fitting MHC-SF factor model were examined in multigroup confirmatory factor analysis. We tested configural invariance (Is the configuration of the model the same across groups?), metric/weak invariance (Are factor loadings the same across groups?), scalar/strong invariance (Are the intercepts the same across groups?), and strict invariance (Are the residual variances the same across groups?) across gender (boys vs girls) and grades (7^{th} vs 8^{th} vs 9^{th}). Configural invariance was confirmed if RSMEA and SRMR were < .08 and CFA was > .95 (Cheung & Rensvold, 2002). A relative change of ≤ .010 in CFI, supplemented by a relative change of ≤ .015 in RMSEA or ≤ .030 in SRMR indicated that the null hypothesis of invariance should not be rejected (Chen, 2007).

RESULTS

Factor Structure

Table 1 presents the CFA fit indices for the three models. Model 1 and Model 2, representing a one-factor and two-factor structure, respectively, were found to have a poor absolute fit. The hypothesized three-factor model (Model 3) fitted the data significantly better than Model 1 ($\Delta\chi^2(3) = 220.96$, $p < .001$) and Model 2 ($\Delta\chi^2(2) = 126.97$, $p < .001$). All items had statistically significant ($p < .05$) loadings on their expected factors (i.e., emotional, psychological, and social well-being), as presented in Table 2, and the fit of Model 3 was satisfactory to good.

Table 1. Results of the confirmatory factor analyses

Model	SB χ^2	df	*p*	RMSEA	90% CI RMSEA	CFI	SRMR
1. One factor	789.09	77	<.001	.089	.085–.094	.861	.057
2. Two factors	602.77	76	< .001	.077	.072–.082	.897	.052
3. Three factors	451.19	74	< .001	.066	.061–.071	.927	.052

Note. SB χ^2 = Santorra-Bentler Chi Squared test, df = degrees of freedom, CI = confidence interval, RMSEA = root mean square error of approximation, CFI = comparative fit index, SRMR = standardised root mean square residual. Criteria for interpreting model fit are: RSMEA < .08, CFI > .90, and SRMR ≤ .08.

Descriptive characteristics

Descriptive results and Pearson correlation coefficients of the MHC-SF total, subscale and item scores are presented in Table 3. Based on the three mental health categories, a majority of the participants ($n = 638$, 54.3%) experienced flourishing levels of well-being, followed by moderate levels, ($n = 475$, 40.4%), with relatively few reporting a languishing level ($n = 62$, 5.3%).

Internal consistency

Internal consistency testing of scores of the MHC-SF total scale and subscales based on Model 3 yielded the following Cronbach's alpha values: emotional well-being subscale, α = .80; psychological well-being subscale, α = .83; social well-being subscale, α = .81; and total MHC-SF, α = .91.

Table 2. Descriptive characteristics and factor loadings of the MHC-SF Items

In the past month, how often did you feel...	Median	Missing (%)	Factor loadings (Model 3)		
			Emotional well-being	Psychological well-being	Social well-being
Emotional well-being					
1. Happy	4.00	0.3%	.78		
2. Interested in life	4.00	0.5%	.72		
3. Satisfied	4.00	0.3%	.79		
Social well-being					
4. That you had something important to contribute to society	3.00	0.5%			.66
5. That you belonged to a community (like a group of friends, at school or in the neighborhood)	5.00	0.4%			.49
6. That our society is becoming a better place for people	2.00	0.6%			.78
7. That people are basically good	3.00	0.5%			.79
8. That the way our society works makes sense to you	3.00	0.5%			.71
Psychological well-being					
9. That you liked most parts of your personality	4.00	0.6%		.78	
10. Good at managing the responsibilities of your daily life	4.00	0.6%		.69	
11. That you had warm and trusting relationships with others	4.00	0.8%		.62	
12. That you have experiences that challenge you to grow and become a better person	3.00	0.9%		.47	
13. Confident to think or express your own ideas and opinions	4.00	0.7%		.72	
14. That your life has a sense of direction or meaning to it	4.00	0.8%		.75	

Table 3. Descriptive statistics and Pearson correlation coefficients of the MHC-SF subscales

Dimension	Emotional well-being	Psychological well-being	Social well-being	MHC-SF Total
M (*SD*)	3.88 (0.94)	3.47 (1.08)	2.93 (1.19)	3.36 (0.98)
Emotional well-being	–	.70***	.60***	
Psychological well-being	.63***	–	.70***	
Social well-being	.60***	.74***	–	

Note. Correlations for girls are presented above the diagonal and correlations for boys below the diagonal.
***$p < .001$

Construct validity

The correlations of MHC-SF and the corresponding validation measures of well-being and mental illness symptoms are reported in Table 4. We observed significant positive correlations of MHC-SF scores with the PANAS-C, Kidscreen-27, SPF-ILs, and Cantril's ladder validation measures, confirming convergent validity. Most of the correlations were high in magnitude and a few were moderate. In addition, significant negative correlations, mostly of moderate strength, were found between the MHC-SF and the RCADS-25 mental illness symptoms measure. These results supported divergent validity.

Measurement invariance

The multigroup confirmatory factor analysis results are presented in Table 5. The three-factor model (Model 3) fitted the data satisfactorily across genders and grades, indicating that configural invariance was supported. Hereafter, equality constraints were imposed on all factor loadings for both gender and all grade groups. The ΔCFI, ΔRSMEA, and ΔSRMR indicated full metric invariance (< .01). Equality constraints were then imposed on all intercepts and the three difference tests also indicated full scalar invariance. Finally, equality constraints were imposed on all residual variances, with the ΔCFI, ΔRSMEA, and ΔSRMR supporting full strict invariance.

Table 4. Pearson correlation coefficients for construct validity

Instrument	MHC-SF well-being dimension subscale			MHC-SF total
	Emotional	Psychological	Social	
Convergent validity				
PA of PANAS-C	.58***	.52***	.45***	.56***
Kidscreen-27	.67***	.55***	.50***	.62***
SPF-ILs	.62***	.65***	.55***	.68***
Cantril's ladder	.58***	.44***	.39***	.50***
Divergent validity				
RCADS-25	−.51***	−.46***	−.41***	−.50***
Depression	−.55***	−.48***	−.43***	−.53***
Anxiety	−.41***	−.38***	−.34***	−.41***

*** $p < .001$

Note. PA of PANAS-C = positive affect dimension of the Positive and Negative Affect Scale for Children, SPF-ILs = Social Production Function Instrument for the Level of well-being-short, RCADS-25 = Revised Child Anxiety and Depression Scale-25.

Table 5. Measurement invariance across gender and grades (Model 3)

Model	SB χ^2	df	RMSEA	ΔRMSEA	CFI	ΔCFI	SRMR	ΔSRMR
Gender invariance								
1. Configural	735.84	148	.083	–	.919	–	.053	–
2. Metric	750.37	159	.080	.003	.919	.000	.055	.002
3. Scalar	806.59	170	.080	.000	.913	.006	.059	.004
4. Strict	845.14	184	.079	.001	.909	.004	.060	.001
Grade invariance								
1. Configural	806.67	222	.083	–	.921	–	.055	–
2. Metric	826.44	244	.079	.004	.921	.000	.059	.004
3. Scalar	872.13	266	.077	.002	.918	.003	.061	.002
4. Strict	956.77	294	.076	.001	.910	.008	.064	.003

Note. SB χ^2 = Santorra-Bentler Chi Squared test, df = degrees of freedom, CI = confidence interval, RMSEA = root mean square error of approximation, CFI = comparative fit index, SRMR = standardised root mean square residual. Criteria for interpreting model fit are: RSMEA < .08, CFI > .90, and SRMR ≤ .08.

DISCUSSION

To evaluate the psychometric properties of the Dutch version of the MHC-SF in a school-based sample of adolescents, we tested the factor structure and invariance and assessed internal consistency and construct validity of the MHC-SF. All items loaded significantly on their expected factors, consistent with prior research in adolescents (Donnelly et al., 2019; Doré et al., 2017; Guo et al., 2015; Karaś et al., 2014; Lim, 2014; Salama-Younes, 2011; Singh et al., 2015) and in Dutch adults (Lamers et al., 2011). CFA-analyses confirmed the three-factor structure of the MHC-SF. The three-factor model was the best-fitting model to these data, suggesting that the items measuring emotional, psychological, and social well-being are reflections of three distinct but correlated latent factors. The goodness of fit of the three-factor model was satisfactory to good and comparable to, sometimes even better than, results from prior studies in adolescent and adult samples (Donnelly et al., 2019; Doré et al., 2017; Guo et al., 2015; Karaś et al., 2014; Keyes, 2005; Keyes et al., 2008, 2012; Lim, 2014; Perugini et al., 2017; Petrillo et al., 2015; Salama-Younes, 2011; Singh et al., 2015).

We observed good internal consistency for the MHC-SF and, as expected, moderate-to-high associations with well-being validation measures—namely PA of the PANAS-C, Kidscreen-27, SPF-ILs, and Cantril's ladder—supporting convergent validity. Some measures, such as the Kidscreen-27 and SPF-ILs, cover a broader conceptualization of well-being than others like the PANAS-C and Cantril's ladder. The well-being validation measure SPF-Ils, for example, correlated strongest with total MHC-SF score, an assessment of overall well-being. This result is not surprising given that the SPF-ILs

is used as an overall well-being measure encompassing social and physical well-being subdimensions. On the other hand, the PANAS-C and Cantril's ladder instruments are more specific measures of emotional well-being and life satisfaction and indeed correlated strongest with the MHC-SF emotional well-being subscale. Thus, the MHC-SF is a reliable and valid instrument to assess well-being of adolescents.

The mostly moderate associations of the MHC-SF with mental illness symptoms (i.e., anxiety and depression symptoms) supported divergent validity. Previous studies involving adolescents and Dutch adults have also shown divergent validity of the MHC-SF vis-à-vis correlations with anxiety and depression symptoms (Karaś et al., 2014; Keyes et al., 2008; Lim, 2014; Petrillo et al., 2015; Singh et al., 2015). Consistent with the dual-continuum model, in which mental health and mental illness are conceptualized as two distinct, yet related continua, our results showed correlations between mental health and mental illness symptoms measures, with some divergence. The correlations were weaker compared to the correlations with the well-being validation measures, but still significant. This indicates that the absence of mental illness does not necessarily imply the presence of well-being and emphasizes the importance of a positive psychological approach in the assessment of mental health.

Finally, full strict invariance was observed by gender and grade. The MHC-SF structure, factor loadings, intercepts, and residual variances were the same in boys and girls, and also the same across different age groups, in line with our expectations based on recent studies (Doré et al., 2017; Guo et al., 2015; Karaś et al., 2014; Lim, 2014; Petrillo et al., 2015). These findings indicate that the MHC-SF measures well-being with the same level of accuracy in boys and girls and with the same level of accuracy across different age groups, which supports broad usage of the MHC-SF to measure well-being in adolescent populations.

Limitations and future research directions

Although this study was strengthened by the use of a large sample of Dutch adolescents (N = 1,175), the national generalizability of our results may have been compromised by our use of a school-based sample. To examine the representativeness of this sample, a comparison was made to the Health Behaviour in School-age Children (HBSC) study, where the sample is considered to be representative of the general Dutch adolescent population (Stevens et al., 2018). This comparison showed that our sample may be considered representative with respect to gender, age, and household characteristic variances. However, it differed from the HBSC study regarding ethnicity and education level in that our cohort had over-representations of participants with a non-Western ethno-cultural background (42% vs. 17%) and with a high education level (73% vs.

53%). These differences may be explained by the fact that the four involved schools were located in two relatively diverse metropolitan areas that tend to have more adolescents with a non-Western ethno-cultural background than other, less urban areas in the Netherlands. In addition, the involved schools consisted of more adolescents with a high educational level. The involvement of more schools with diverse educational levels is, therefore, recommended in future research.

Ethnicity and educational level are important determinants of health and well-being (Inchley et al., 2016) and, therefore, the over-representations of a non-Western ethno-cultural background and high education level may have biased our results. However, in accordance with Dutch adolescents being among the happiest and most satisfied with their lives around the world (Stevens et al., 2018), the percentage of flourishing adolescents (54.3%) in this study was much higher than the percentages reported for other adolescent samples (23.4% in Egypt, Salama-Younes, 2011; 11.7% in Korea, Lim, 2014).

Furthermore, it should be noted that our data were hierarchical in nature with students nested in grades and schools. When we evaluated the necessity of using multilevel models, we found some variance at level of grade, but not of school. This variance was, however, fairly small and did not affect our conclusions (data available upon request). Consequently, we performed our analyses without accounting for the nested structure.

It is recommended that, in addition to emotional, psychological, and social well-being, a dimension of physical well-being be included in future research to assess adolescents' overall well-being. Keyes' dual-continuum model and the MHC-SF focus on emotional, psychological, and social well-being as positive mental health. However, there is consensus that mental and physical health are deeply interdependent (McCloughen et al., 2012). Moreover, the MHC-SF includes only positive items to measure well-being even though the dual-continuum model proposes that well-being can be achieved even when there are negativities such as mental illness or feelings of negative affect like sadness. Negative aspects of well-being are likely to be relevant for social and psychological well-being, especially with respect to troubled social relationships or social dysfunction. Finally, future studies are needed to validate the MHC-SF in clinical adolescent populations and to perform cross-country comparisons of measurement invariance.

CONCLUSIONS

This is the first study to evaluate psychometric properties of the Dutch version of the MHC-SF in an adolescent sample. The results indicated that the MHC-SF is a valid and reliable instrument that can be administered to assess different dimensions of well-being in adolescents across mental health, education, and health policy contexts. The brevity of the MHC-SF (14 items) and its cross-contextual utility make it highly suitable for scientific and epidemiological monitoring of adolescent mental health and well-being. It may also provide a useful tool that can be used across interventions and prevention strategies because of the importance to promote and protect well-being in addition to reducing mental illness symptoms. The ability to distinguish among flourishing, moderate, and languishing adolescents creates the possibility to manage multiple dimensions of well-being to ensure more complete mental health and to choose and implement interventions that are informed by an individual's position along both the mental illness and well-being dimensions. Ultimately, the ability to properly assess the complexity and multidimensionality of well-being may lead to more effective improvements in adolescent mental health and related developmental outcomes. The present findings enable future comparisons between adolescent samples across countries and contribute to the extensive use of the MHC-SF in research and clinical practice.

REFERENCES

Antaramian, S. P., Huebner, E. S., Hills, K. J., & Valois, R. F. (2010). A dual-factor model of mental health: Toward a more comprehensive understanding of youth functioning. *American Journal of Orthopsychiatry, 80*(4), 462–472. https://doi.org/10.1111/j.1939-0025.2010.01049.x

Bentler, P., & Bonett, D. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588-606. https://doi.org/10.1037/0033-2909.88.3.588

Blakemore, S. J. (2008). The social brain in adolescence. *Nature Reviews Neuroscience, 9*(4), 267-277. https://doi.org/10.1038/nrn2353

Bradburn, N. (1969). *The structure of psychological well-being.* Chicago: Aldine.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research.* New York: The Guilford Press.

Cantril, H. (1965). *Pattern of human concerns.* New Brunswick, NJ: Rutgers University Press.

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*(3), 464-504. https://doi.org/10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255. https://doi.org/10.1207/S15328007SEM0902_5

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Diener, E. (1984). Subjective well-being. Psychological Bulletin, 95(3), 542–575. https://doi.org/10.1037/0033-2909.95.3.542

Diener, E. (2009). Subjective well-being. In: E. Diener (Ed.), *The science of well-being* (pp. 11-58). Social Indicators Research Series, vol 37. Dordrecht: Springer.

Donnelly, A., O'Reilly, A., Dolphin, L., O'Keeffe, L., & Moore, J. (2019). Measuring the performance of the Mental Health Continuum-Short Form (MHC-SF) in a primary care youth mental health service. Irish Journal of Psychological Medicine, 36(3), 201-205. https://doi.org/10.1017/ipm.2018.55

Doré, I., O'Loughlin, J. L., Sabiston, C. M., & Fournier, L. (2017). Psychometric Evaluation of the Mental Health Continuum–Short Form in French Canadian Young Adults. *The Canadian Journal of Psychiatry, 62*(4), 286-294. https://doi.org/10.1177/0706743716675855

Ebesutani, C., Regan, J., Smith, A., Reise, S., Higa-McMillan, C., & Chorpita, B. F. (2012a). The 10-item positive and negative affect schedule for children, child and parent shortened versions: application of item response theory for more efficient assessment. *Journal of Psychopathology and Behavioral Assessment, 34*(2), 191-203. https://doi.org/10.1007/s10862-011-9273-2

Ebesutani, C., Reise, S. P., Chorpita, B. F., Ale, C., Regan, J., Young, J., . . . Weisz, J. R. (2012b). The Revised Child Anxiety and Depression Scale-Short Version: Scale reduction via exploratory bifactor modeling of the broad anxiety factor. *Psychological Assessment, 24*(4), 833-845. https://doi.org/10.1037/a0027283

Gallagher, M. W., Lopez, S. J., & Preacher, K. J. (2009). The hierarchical structure of well-being. *Journal of Personality, 77*(4), 1025-1050. https://doi.org/10.1111/j.1467-6494.2009.00573.x

Guo, C., Tomson, G., Guo, J., Li, X., Keller, C., & Söderqvist, F. (2015). Psychometric evaluation of the Mental Health Continuum-Short Form (MHC-SF) in Chinese adolescents–a methodological study. *Health and Quality of Life Outcomes, 13*(1), 198. https://doi.org/10.1186/s12955-015-0394-2

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., Mathison, F., Aleman-Diaz, A., Molcho, M., Weber, M., & Barnekow, V. (2016). Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health Behaviour in School-aged Children (HBSC) study: international report from the 2013/2014 survey. Copenhagen: WHO Regional Office for Europe.

Insel, T. R., & Scolnick, E. M. (2006). Cure therapeutics and strategic prevention: raising the bar for mental health research. *Molecular Psychiatry*, *11*(1), 11-17. https://doi.org/10.1038/sj.mp.4001777

Kahneman, D., Diener, E., & Schwarz, N. (Eds.) (1999). *Well-being: Foundations of hedonic psychology*. New York: Russell Sage Foundation.

Karaś, D., Cieciuch, J., & Keyes, C. L. (2014). The polish adaptation of the mental health continuum-short form (MHC-SF). *Personality and Individual Differences*, *69*, 104-109. https://doi.org/10.1016/j.paid.2014.05.011

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 593-602. https://doi.org/10.1001/archpsyc.62.6.593

Keyes, C. L. (1998). Social well-being. *Social Psychology Quarterly, 61*(2), 121-140. https://doi.org/10.2307/2787065

Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, *43*(2), 207-222. https://doi.org/10.2307/3090197

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Keyes, C. L. (2006). The subjective well-being of America's youth: Toward a comprehensive assessment. *Adolescent & Family Health*, *4*(1), 3-11.

Keyes, C. L., Eisenberg, D., Perry, G. S., Dube, S. R., Kroenke, K., & Dhingra, S. S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American College Health*, *60*(2), 126-133. https://doi.org/10.1080/07448481.2011.608393

Keyes, C. L., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., & Van Rooy, S. (2008). Evaluation of the mental health continuum–short form (MHC–SF) in setswana-speaking South Africans. *Clinical Psychology and Psychotherapy, 15*(3), 181-192. https://doi.org/10.1002/cpp.572

Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., ... & Rahman, A. (2011). Child and adolescent mental health worldwide: evidence for action. *The Lancet*, *378*(9801), 1515-1525. https://doi.org/10.1016/S0140-6736(11)60827-1

Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of Clinical Psychology*, *67*(1), 99-110. https://doi.org/10.1002/jclp.20741

Lei, P. (2009). Evaluating estimation methods for ordinal data in structural equation modeling.*Quality and Quantity, 43(3),*495. https://doi.org/10.1007/s11135-007-9133-z

Levin, K., & Currie, C. (2014). Reliability and validity of an adapted version of the Cantril Ladder for use with adolescent samples. *Social Indicators Research, 119*(2), 1047-1063. https://doi.org/10.1007/s11205-013-0507-4

Lim, Y. J. (2014). Psychometric characteristics of the Korean Mental Health Continuum–Short Form in an adolescent sample. *Journal of Psychoeducational Assessment, 32*(4), 356-364. https://doi.org/10.1177/0734282913511431

McCloughen, A., Foster, K., Huws-Thomas, M., & Delgado, C. (2012). Physical health and wellbeing of emerging and young adults with mental illness: An integrative review of international literature. *International Journal of Mental Health Nursing, 21*(3), 274-288. https://doi.org/10.1111/j.1447-0349.2011.00796.x

Nieboer, A., Lindenberg, S., Boomsma, A., & Bruggen, A. C. V. (2005). Dimensions of well-being and their measurement: the SPF-IL scale. *Social Indicators Research, 73*(3), 313-353. https://doi.org/10.1007/s11205-004-0988-2

Nunnally, J., & Bersntein, I. (1995). *Psychometric theories*. Madrid, Spain: McGraw-Hill.

Oranje, A. (2003, April). *Comparison of estimation methods in factor analysis with categorical variables: Applications to NAEP data.*Paper presented at the annual meeting of the American Education Research Association (AERA), Chicago, IL.

Ormel, J., Raven, D., van Oort, F., Hartman, C. A., Reijneveld, S. A., Veenstra, R., ... & Oldehinkel, A. J. (2015). Mental health in Dutch adolescents: a TRAILS report on prevalence, severity, age of onset, continuity and co-morbidity of DSM disorders. *Psychological Medicine, 45*(2), 345-360. https://doi.org/10.1017/S0033291714001469

Paus, T., Keshavan, M., & Giedd, J. N. (2008). Why do many psychiatric disorders emerge during adolescence?. *Nature Reviews Neuroscience, 9*(12), 947-957. https://doi.org/10.1038/nrn2513

Perugini, M. L. L., de la Iglesia, G., Solano, A. C., & Keyes, C. L. M. (2017). The mental health continuum–short form (MHC–SF) in the Argentinean context: Confirmatory factor analysis and measurement invariance. *Europe's Journal of Psychology, 13*(1), 93-108. https://doi.org/10.5964/ejop.v13i1.1163

Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and classification* (Vol. 1). Washington, DC: American Psychological Association.

Petrillo, G., Capone, V., Caso, D., & Keyes, C. L. (2015). The Mental Health Continuum–Short Form (MHC–SF) as a measure of well-being in the Italian context. *Social Indicators Research, 121*(1), 291-312. https://doi.org/10.1007/s11205-014-0629-3

Ravens-Sieberer, U., Auquier, P., Erhart, M., Gosch, A., Rajmil, L., Bruil, J., . . . Czemy, L. (2007). The KIDSCREEN-27 quality of life measure for children and adolescents: psychometric results from a cross-cultural survey in 13 European countries. *Quality of Life Research, 16*(8), 1347-1356. https://doi.org/10.1007/s11136-007-9240-2

Resnick, M. D., Harris, L. J., & Blum, R. W. (1993). The impact of caring and connectedness on adolescent health and well-being. *Journal of Paediatrics and Child Health, 29*(1), S3-S9. https://doi.org/10.1111/j.1440-1754.1993.tb02257.x

Rogers, C. (1961). *On becoming a person: A therapist's view of psychotherapy*. London: Constable & Company.

Ryff, C. D. (1989a). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069-1081. https://doi.org/10.1037/0022-3514.57.6.1069

Ryff, C. D. (1989b). Beyond Ponce de Leon and life satisfaction: New directions in quest of successful ageing. *International Journal of Behavioral Development, 12*(1), 35-55. https://doi.org/10.1177/016502548901200102

Salama-Younes, M. (2011). Validation of the mental health continuum short form and Subjective Vitality Scale with Egyptian adolescent athletes. In I. Brdar (Ed.), *The human pursuit of well-being* (pp. 221-234). Dordrecht: Springer.

Seligman, M. (2010). Flourish: Positive psychology and positive interventions. *The Tanner lectures on human values* (pp. 1-243). Ann Arbor, Michigan: The University of Michigan.

Singh, K., Bassi, M., Junnarkar, M., & Negri, L. (2015). Mental health and psychosocial functioning in adolescence: An investigation among Indian students from Delhi. *Journal of Adolescence, 39*, 59-69. https://doi.org/10.1016/j.adolescence.2014.12.008

Snyder, C. R., & Lopez, S. J. (Eds.). (200s). *Handbook of positive psychology*. New York: Oxford University Press.

Steiger, J. H., & Lind, J. C. (1980, May). Statistically-based tests for the number of common factors. *Paper presented at the annual meeting of the Psychometric Society*, Iowa City, IA.

Suldo, S. M., & Shaffer, E. J. (2008). Looking beyond psychopathology: the dual-factor model of mental health in youth. *School Psychology Review, 37*(1), 52-68. https://doi.org/10.1080/02796015.2008.12087908

Suldo, S., Thalji, A., & Ferron, J. (2011). Longitudinal academic outcomes predicted by early adolescents' subjective well-being, psychopathology, and mental health status yielded from a dual factor model. *The Journal of Positive Psychology, 6*(1), 17-30. https://doi.org/10.1080/17439760.2010.536774

Stevens, G., Van Dorsselaer, S., Boer, M., De Roos, S., Duinhog, E., Ter Bogt, T., ..., De Loozw, M. (2018). *HBSC 2017. Gezondheid en welzijn van jongeren in Nederland.* Available at: https://hbsc-nederland.nl/wp-content/uploads/2018/09/Rapport-HBSC-2017.pdf

The Kidscreen Group Europe. (2006). *The KIDSCREEN Questionnaires – Quality of life questionnaires for children and adolescents. Handbook.* Lenge-rich: Pabst Science Publishers.

Verboom, C. E., Sijtsema, J. J., Verhulst, F. C., Penninx, B. W., & Ormel, J. (2014). Longitudinal associations between depressive problems, academic performance, and social functioning in adolescent boys and girls. *Developmental Psychology, 50*(1), 247-257. https://doi.org/10.1037/a0032547

Weisz, J. R., Kuppens, S., Ng, M. Y., Eckshtain, D., Ugueto, A. M., Vaughn-Coaxum, R., Jensen-Doss, A., Hawley, K. M., Krumholz Marchette, L. S., Chu, B. C., Weersing, V. R., & Fordwood, S. R. (2017). What five decades of research tells us about the effects of youth psychological therapy: A multilevel meta-analysis and implications for science and practice. *American Psychologist, 72*(2), 79–117. https://doi.org/10.1037/a0040360

World Health Organization. (2004). *Promoting mental health: Concepts, emerging evidence, practice: Summary report.* World Health Organization.

Yang-Wallentin, F., Jöreskog, K. G., & Luo, H. (2010). Confirmatory factor analysis of ordinal variables with misspecified models.*Structural Equation Modeling, 17(3),*392–423.https://doi.org/10.1080/10705511.2010.489003

Yuan, K. H. and Bentler, P. M. (2000). 5. Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology, 30*, 165-200. https://doi.org/10.1111%2F0081-1750.00078

3

Associations between adolescents' internalizing problems and well-being: Is there a buffering role of boys' and girls' relationships with their mothers and fathers?

This paper was published as:
Luijten, C. C., Van de Bongardt, D., Jongerling, J., & Nieboer, A. P. (2021). Associations between adolescents' internalizing problems and well-being: Is there a buffering role of boys' and girls' relationships with their mothers and fathers?. BMC Public Health, 21(1), 1871. https://doi.org/10.1186/s12889-021-11920-4

ABSTRACT

Background

Internalizing mental health problems (i.e., depression and anxiety symptoms) are known to be related negatively to adolescents' well-being. However, whether this negative association manifests equally in boys and girls, and the potential buffering role of high-quality relationships with mothers and fathers, remain unknown. Thus, the present study was conducted to 1) investigate associations among adolescents' internalizing problems and mother– and father–adolescent relationship quality, on the one hand, and adolescents' well-being, on the other hand, 2) explore the buffering role of high-quality mother– and father–adolescent relationships in the association between adolescents' internalizing problems and well-being, and 3) examine gender differences in these main and buffering effects.

Methods

The analysis sample consisted of 1,064 adolescents (53.7% girls; aged 11–17 years) from three secondary schools in the Netherlands. Participants filled out an online questionnaire incorporating the Mental Health Continuum–Short Form to measure well-being, the Revised Child Anxiety and Depression Scale-25 to measure internalizing problems, and the Network of Relationships Inventory to measure mother– and father–adolescent relationship quality. The cross-sectional data were analyzed using path models in R, controlling for age, ethnocultural background, and education level. Multigroup analyses were performed to identify gender differences.

Results

Adolescents with fewer internalizing problems ($\beta = -0.40$, $p < .001$) and adolescents with higher-quality relationships with their mothers and fathers reported higher concurrent levels of well-being ($\beta = 0.10$ to 0.18, all $p < .01$). The quality of mother–adolescent relationships had a significantly larger association with adolescents' well-being than that of father–adolescent relationship quality. However, relationships with mothers and fathers did not significantly buffer the association between adolescents' internalizing problems and well-being. Multigroup analyses revealed no difference between boys and girls.

Conclusions

The current study contributes to the understanding of internalizing problems as an important risk factor for adolescents' well-being, regardless of the quality of relationships with mothers and fathers. The quality of adolescents' relationships with their parents is associated positively with their well-being, even in the presence

of internalizing problems. These findings underline the importance of mothers' and fathers' roles in adolescent boys' and girls' well-being.

INTRODUCTION

Adolescence is a challenging developmental period characterized by multiple emotional, physical, and social transformations (Steinberg & Morris, 2001), which may explain the increased prevalence of internalizing symptoms during this period (Reitz et al., 2005). A large-scale study of the health and well-being of European adolescents (aged 11–16 years) showed that almost one in five adolescents in the Netherlands experiences internalizing problems (Stevens et al., 2018). Internalizing problems include depression, anxiety, social withdrawal, and somatic or physical problems (e.g., fears, concerns, headaches, and stomachaches; Merrell, 2008; Plenty et al., 2014). The most common of these problems among adolescents are anxiety and depression (Costello et al., 2011).

In recent decades, many empirical studies have shown that adolescents' internalizing problems are associated with decreased levels of well-being, as these problems negatively affect how adolescents feel about themselves and their way of living (Bartels et al., 2013; Lyons et al., 2013). Well-being is defined as a combination of a hedonic conception, focusing on, for instance, happiness, positive emotions, and satisfaction with life, and a eudaimonic conception, comprising good functioning in one's individual endeavors and social life (Diener, 2009; Gallagher et al., 2009). Despite consensus in the scientific literature that adolescents with more internalizing problems tend to have lower well-being, knowledge of whether this association manifests equally in boys and girls, and what strengthening or weakening role parents play in it, is limited. The exploration of whether adolescents' relationships with their mothers and fathers are associated with the well-being of boys and girls, especially those with more internalizing problems, is of great relevance because such problems tend to have chronic, recurring courses and can persist into adulthood (Garber & Weersing, 2010; Scholten et al., 2011). Thus, internalizing problems not only affect adolescents and their family and school environments, but also impose a significant public health burden (Gore et al., 2011).

Although the concepts of internalizing problems and well-being are often used interchangeably in the literature, they are not the same. According to the dual-continuum model, mental health problems (e.g., internalizing problems) and well-being are related, yet distinct, continua, rather than opposite ends of a single continuum (Keyes, 2005). According to this model, although the experience of internalizing problems can interfere with well-being, this relationship is not of a one-to-one nature; adolescents with internalizing problems may have high levels of well-being and vice versa. Empirical research has validated the dual-continuum model by identifying these subgroups of young people (i.e., those with high levels of internalizing problems, high

levels of well-being and those with low levels of internalizing problems, low levels of well-being; Keyes, 2005; Suldo & Shaffer, 2008) and revealing merely moderate correlations between internalizing problems and well-being (e.g., Antaramian et al., 2010; Haworth et al., 2017; Luijten et al., 2019).

In examining the association between adolescents' internalizing problems and well-being, social determinants, including characteristics of adolescents' social environments, must be considered in addition to individual characteristics. According to ecological theories of adolescent development (e.g., Bronfenbrenner, 1979), relationships with parents are among the most proximal and prominent of adolescents' social relationships. Adolescents' perception of the *quality* of their relationships with their parents, which can be characterized by the levels of warmth and conflict (Furman & Buhrmester, 2009), are important for their internalizing problems and well-being (Chu et al., 2010; Guo et al., 2018; Hale et al., 2020; Yucel & Yuan, 2016). For instance, adolescents (aged 10–15 years) in the United Kingdom with higher-quality relationships with their parents reported higher well-being than did those with lower-quality relationships (Yucel & Yuan, 2016).

Higher-quality parent–adolescent relationships have been argued theoretically to be resources that can help to reduce or buffer adverse outcomes (e.g., lower well-being) among adolescents with heightened exposure to risk factors (e.g., internalizing problems; Fergus & Zimmerman, 2005). The buffering ability of these relationships has been studied in several contexts (e.g., in examining the link between early sexual activity and adolescents' well-being; Markham et al., 2010), and mixed results have been reported. The potential buffering effect of high-quality parent–adolescent relationships on the association between adolescents' internalizing problems and well-being has not been evaluated.

In addition, most studies of parent–adolescent relationship quality have not distinguished between relationships with mothers and those with fathers, implying that these relationships are interchangeable (Cabrera et al., 2014; Flouri, 2010). Family systems theory (e.g., Cox & Paley, 1997) suggests that families consist of several subsystems, including various dyadic family relationships (e.g., mother–child, father–child) that are partly independent and partly interdependent, and as such continuously and reciprocally affect one another. Increasing evidence indicates that mothers and fathers play unique roles in the development of children and adolescents (Keizer et al., 2019; Lewis & Lamb, 2003; Nogueira Avelar E Silva et al., 2016). Thus, separate examination of the roles of mother– and father–adolescent relationships is important.

In the present study, we aimed to address these research gaps by: 1) investigating the associations among adolescents' internalizing problems and mother– and father–adolescent relationship quality, on the one hand, and adolescents' well-being, on the other hand, 2) exploring the buffering role of high-quality mother– and father–adolescent relationships in the association between adolescents' internalizing problems and well-being, and 3) examining gender differences in these main and buffering effects. We hypothesized that adolescents' internalizing problems would be associated negatively with their well-being, supporting published findings (Bartels et al., 2013; Lyons et al., 2013). In addition, we expected that the quality of mother– and father–adolescent relationships would be related directly and positively to adolescents' well-being, supporting the theoretical importance of considering maternal and paternal factors in research on adolescents (Cabrera et al., 2014; Flouri, 2010).

Various theoretical models describe how relationships with multiple social agents (e.g., mothers and fathers) have simultaneous (i.e., interactive) effects on adolescents' well-being. For example, according to the compensation model, a high-quality relationship with one parent may buffer the link between an adolescent's internalizing problems and well-being, compensating the effect of a low-quality relationship with the other parent (Zhang et al., 2018). According to the additive model, however, adolescents with high-quality relationships with both parents benefit more than those with such a relationship with only one parent in terms of the buffering role of these relationships (Zhang et al., 2018). Thus, we also exploratively examined three-way interaction effects among adolescents' internalizing problems and the quality of their relationships with their mothers and fathers.[1]

Research on dyadic family relationships has shown that parent–adolescent relationships differ depending on the gender of both parents and adolescents (McHale et al., 2003). Mothers, rather than fathers, tend to remain the primary attachment figures during their sons' and daughters' adolescence, contributing more to their development, including their mental health and well-being (Branje et al., 2010; Keizer et al., 2019; Rosenthal & Kobak, 2010). Fathers tend to spend more time with their sons than with their daughters from early childhood (Pleck & Masciadrelli, 2004), and the quality of father–adolescent relationships tends to be more important for the development (e.g., self-esteem) of sons relative to daughters (Song et al., 2009). Thus, we hypothesized that high-quality relationships with mothers would be stronger buffers than high-quality relationships with fathers in the association between the internalizing problems and well-being of

1 These results should be interpreted with caution, as the statistical power for three-way interaction effects may be limited.

adolescent boys and girls, and that high-quality father–adolescent relationships would be stronger buffers for boys than for girls.

METHODS

Participants

Data for this study were collected in the context of a larger project examining socioecological predictors of well-being in adolescents aged 11.0–17.0 years. The initial sample consisted of 1,124 adolescents. We excluded participants who reported that they did not have a mother and/or father (n = 55) and those with missing data for all variables of interest (n = 5). Thus, adolescents whose parents were both alive were included in this study, regardless of family structure and living situation (e.g., living with both parents [77.5%], living with one parent [14.5%], separated parents with co-parenting [7.4%], living with others such as foster parents [0.6%]). Thus, the final sample consisted of 1,064 adolescents (53.7% girls) aged 11.0–17.0 years (mean [M] = 13.7 years, standard deviation [SD] = 1.1 year).

Based on the stratified Dutch secondary education system, most (74.2%) participants were enrolled in higher (i.e., senior general [hoger algemeen voortgezet onderwijs] and pre-university [voorbereidend wetenschappelijk onderwijs]) education and 25.8% were enrolled in lower (i.e., pre-vocational [voorbereidend middelbaar beroepsonderwijs]) education. More than half (57.7%) of the participants had Western ethnocultural backgrounds (i.e., they and their parent[s] were born in Europe, the United States, Canada, Australia, or New Zealand); 42.3% had non-Western backgrounds (i.e., they and/or their parent[s] were born in Africa, the Middle East, Asia, Latin America, or South America). The excluded students (n = 60) were significantly older (M = 14.03 years, SD = 1.35 years) than the included participants, with no difference in internalizing problems and well-being. Because of this difference and the documented relevance of age to the central concepts investigated in this study (e.g., Yucel & Yuan, 2016), age was included as a control variable.

Procedure

The participants were recruited from three secondary schools in the Netherlands that provided active informed consent for their students' participation. Seventh-, eighth-, and ninth-grade students and their parents or guardians received information letters by email describing the study aims and procedure, the right to voluntary participation, and confidentiality of data. Informed consent was taken from the parents/guardians as all participants were minors (under 18 years old). Upon receipt of parental or guardian

consent, informed consent from adolescents was obtained separately; the adolescents provided face-to-face consent and were allowed to decline participation or withdraw from the study at any time. In total, 6.2% (*n* = 84) of contacted parents/guardians and 1.0% (*n* = 13) of adolescents used this opportunity to decline participation. The medical ethics committee of Erasmus Medical Centre, Rotterdam, the Netherlands determined that the rules stipulated in the Medical Research Involving Human Subjects Act did not apply to this study, and thus that the present study did not need to be further evaluated by an official medical ethical review board (protocol no. MEC-2018-055).

Participating adolescents filled out online questionnaires in their classrooms during regular school hours. Data collection was supervised by the lead researcher (the first author) and research assistants, who introduced the study and procedure, answered questions, ensured maximum privacy, and guaranteed that the students' responses were confidential. After filling out the questionnaire, the participants received small, non-financial incentives and a card listing websites with information about topics covered in the questionnaire, as well as contact details of the researchers for questions. After data collection, one iPhone per school and one gift card per class (range, €5–10 across grades) were awarded to participants in a raffle.

Measures

Well-being

We used the Dutch Mental Health ContinuumShort Form (MHC-SF; Keyes, 2005), which has been validated for use with Dutch adolescents (Luijten et al., 2019), to measure well-being. The respondents were instructed to rate 14 items on a six-point scale (0 = never, 5 = every day) to indicate their degrees of emotional well-being (three items; e.g., "How often did you feel happy?"), psychological well-being (six items; e.g., "How often did you feel good at managing the responsibilities of your daily life?"), and social well-being (five items; e.g., "How often did you feel that you had something important to contribute to society?") in the last month. Mean scores for the 14 items were calculated, with higher scores indicating higher levels of well-being. In our sample, the MHC-SF showed good reliability (Cronbach's $\alpha = 0.91$).

Internalizing problems

The Revised Child Anxiety and Depression Scale-25 (Ebesutani et al., 2012) is a 25-item inventory that measures symptoms of anxiety (15 items; e.g., "When I have a problem, I get a funny feeling in my stomach") and depression (10 items; e.g., "I have problems with my appetite"). It was developed for use with children and adolescents aged 8–18 years. The items are ranked on a four-point scale (0 = never, 3 = always). The reliability and validity of the depression and anxiety subscales (Klaufus et al., 2020),

and the reliability of total scores (sums of the two subscale scores; Ebesutani et al., 2012, Piqueras et al., 2017), have been confirmed. We used the total scale to measure internalizing problems, with higher scores indicating more frequent symptoms of these problems (i.e., depression and anxiety). This scale showed good reliability in the present study (Cronbach's α = 0.91).

Quality of parent–adolescent relationships

The quality of mother– and father–adolescent relationships was measured using the satisfaction (three items; e.g., "How satisfied are you with the relationship with your mother/father?") and conflict (three items; e.g., "How much do you and your mother/father argue with each other?") subscales from the Network of Relationships Inventory (Furman & Buhrmester, 2009). The items are ranked on a six-point scale (1 = none, 6 = the most). Total mother– and father–adolescent relationship quality scores were calculated using all items, with the ranking reversed for the conflict subscale items; higher scores reflect higher overall relationship quality (Van de Bongardt et al., 2014). For our sample, we obtained Cronbach's α values of 0.89 for mothers and 0.90 for fathers.

Statistical analyses

Descriptive statistics were calculated for internalizing problems, the quality of mother– and father–adolescent relationships, and well-being using SPSS software (version 25; IBM Corporation, Armonk, NY, USA). Independent-samples *t* tests were performed to compare the mean levels of these variables between boys and girls. We also examined bivariate correlations, with *r* values of 0.10–0.29, 0.30–0.49, and ≥0.50 considered to reflect weak, moderate, and strong correlations, respectively (Cohen, 1988). The alpha level was set at 5.0%.

To test our hypotheses, we performed structural equation modeling to test path models (see Figure 1) in R (version 4.0.3; R Core Team) using the *lavaan* package (Rosseel, 2019). As missing value analysis performed with SPSS software (version 25; IBM Corporation, Armonk, NY, USA) revealed missing values for internalizing problems (0.2%), well-being (0.2%), and mother– (0.4%), and father– (0.7%) adolescent relationship quality, largely because not all participants completed the online questionnaire, all structural equation modeling was performed using full information maximum likelihood estimation (Enders & Bandalos, 2001). To deal with nonnormality in the data, we used robust maximum likelihood estimation, which corrects for deviations from multivariate normality by computing robust standard errors and adjusted chi-squared values asymptotically equivalent to the Yuan–Bentler test statistic (Sass et al., 2014; Yuan & Bentler, 2000). All continuous independent variables were centered to minimize multicollinearity. In addition to age, ethnocultural background (0 = Western, 1 = non-Western) and education

level (0 = low, 1 = high) were included as control variables because of their documented relevance to the central concepts examined in this study (Kriesi et al., 2012; Salmela-Aro & Tynkkynen, 2010; Smith et al., 2014; Vacek et al., 2010; Yucel & Yuan, 2016).

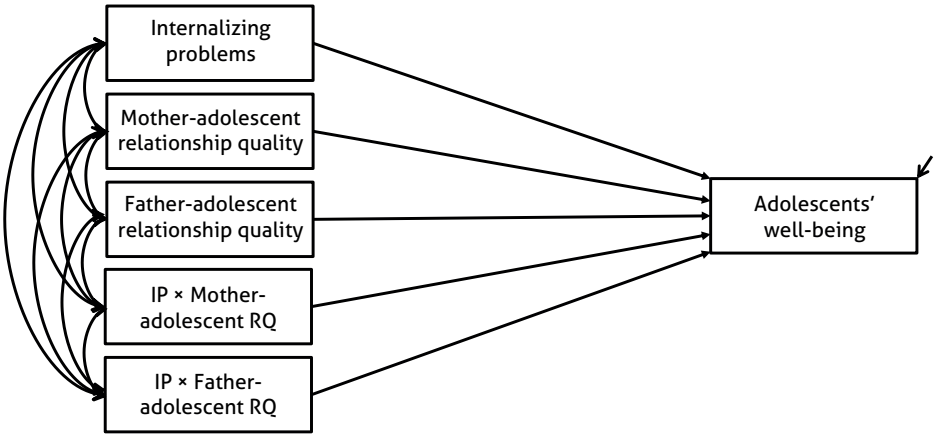

Figure 1. Simplified path diagram of the proposed moderation model
Note. Covariates (i.e., age, ethno-cultural background, and education level) are not depicted in the model. IP = internalizing problems, RQ = relationship quality.

To investigate the main associations of internalizing problems and mother– and father–adolescent relationship quality with adolescents' well-being, we tested four models. Model 1, used to examine the main effect of internalizing problems on well-being, was expanded to include data on mother– and father–adolescent relationship quality separately (models 2 and 3) and together (model 4). Two- and three-way interaction effects of mother– and father–adolescent relationship quality were then examined separately and together in two additional models (internalizing problems × mother–adolescent relationship quality and internalizing problems × father–adolescent relationship quality [model 5], and internalizing problems × mother–adolescent relationship quality × father–adolescent relationship quality [model 6]).

Sample size calculation with Gpower (Faul et al., 2007) revealed that 176 participants would be required to detect small to medium main effects with 95% power and a type 1 error rate of 5%. The final sample of 1,064 adolescents provided sufficient power to test the main effects and two-way interaction effects (Shieh, 2009, 2010). The sample required to test three-way interaction effects is less clear. As interaction effects are typically difficult to detect in non-experimental designs and require relatively large samples, the results of the exploratory analysis of three-way interaction effects should be interpreted with caution. If significant interaction effects were detected,

stratified analyses were performed to explore group differences in parent–adolescent relationship quality.

To identify differences between boys and girls, multigroup analyses were performed using models 4 and 5. An unconstrained multigroup model, in which each parameter was estimated separately for boys and girls, was compared with constrained models in which intercepts and regressions were fixed separately and together between boys and girls. Significant increases or decreases in model fit were taken to reflect gender differences using the Santorra-Bentler χ^2 statistic, root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardised root mean square residual (SRMR). Values of RSMEA < .06, CFI > .95, and SRMR ≤ .08 indicated a good to excellent model fit, whereas RSMEA < .08 and CFI > .90 indicated a satisfactory fit (Bentler & Bonett, 1980; Hu & Bentler, 1999).

RESULTS

Sample characteristics

Levels of well-being and mother– and father–adolescent relationship quality were significantly higher among boys than among girls, and girls experienced significantly more internalizing problems than did boys (Table 1). Significant correlations among well-being, internalizing problems, and mother– and father–adolescent relationship quality were found for boys and girls (Table 2). Correlations with internalizing problems were negative, whereas those between mother– and father–adolescent relationship quality and well-being were positive. Most correlations were moderate; strong correlations were found between internalizing problems and well-being for girls (r = 0.52), and between mother– and father–adolescent relationship quality for boys (r = 0.56). The correlation between father–adolescent relationship quality and well-being in girls was weak (r = 0.28). Age correlated significantly, but weakly, with all variables of interest for girls, but not boys.

Table 1. Sample characteristics

	M (SD)		
	Total sample	**Girls**	**Boys**
Well-being	3.39 (0.97)	3.27 (0.95)	3.53[a] (0.99)
Internalizing problems	11.15 (9.04)	13.57[b] (10.02)	8.32 (6.73)
Mother–adolescent relationship quality	4.87 (0.79)	4.82 (0.84)	4.94[a] (0.73)
Father–adolescent relationship quality	4.74 (0.95)	4.66 (0.99)	4.84[a] (0.90)

All differences between girls and boys were significant (p < .05).
[a]Larger mean scores for boys, [b]larger mean scores for girls.

Table 2. Pearson correlations between variables of interest for male and female adolescents

	1	2	3	4	5
1. Well-being	–	−.52***	.35***	.28***	−.13**
2. Internalizing problems	−.47***	–	−.36***	−.30***	.09*
3. Mother–adolescent relationship quality	.40***	−.43***	–	.35***	−.19***
4. Father–adolescent relationship quality	.32***	−.35***	.56***	–	−.19***
5. Age	.03	−.04	−.02	−.09	–

Correlations above the diagonal are for girls, and those below the diagonal are for boys.
*p < .05, **p < .01, ***p < .001.

Associations between internalizing problems, mother– and father–adolescent relationship quality, and well-being

Participants' age, ethnocultural backgrounds, and education level together explained 1.0% of the variance in adolescents' well-being (R^2 = 0.01, p < .001), but these covariates were not associated significantly with adolescents' well-being in models 1–4 (Table 3). In model 1, internalizing problems and the covariates explained 25.6% of variance in adolescents' well-being. Internalizing problems were associated negatively with adolescents' well-being (Table 3). The addition of mother– and father–adolescent relationship quality (models 2 and 3, respectively) explained an additional 3.6% (ΔR^2 = 0.04, p < .001) and 2.0% (ΔR^2 = 0.02, p < .001) of the variance in adolescents' well-being, respectively. Both of these variables were associated positively with adolescents' well-being (Table 3). Model 4 including both mother– and father–adolescent relationship quality explained 29.9% of the variance in adolescents' well-being. Internalizing problems were associated negatively with adolescents' well-being and the qualities of adolescents' relationships with their mothers and fathers were associated positively with adolescents' well-being (Table 3). The association between mother–adolescent relationship quality and well-being was significantly larger than that of father–adolescent relationship quality and well-being (p = .034). The goodness-of-fit indices of models 1 to 4 revealed good to excellent fit (Table 4).

Model 5 with the two two-way interaction effects added to model 4 explained 30.0% of the variance in adolescents' well-being (R^2 = 0.30, p = .046) and model 6 including the additional exploratory three-way interaction effect explained 30.0% of this variance (R^2 = 0.30, p = .046). No significant interaction (buffering) effect was identified. The goodness-of-fit indices of models 5 and 6 revealed good to excellent fit (Table 4).

Differences between sons and daughters

In the multigroup analyses based on models 4 and 5, the fixing of intercepts revealed significant differences between boys and girls compared with the unconstrained multigroup model ($\Delta\chi^2$ [7] = 111.70, p < .001 and $\Delta\chi^2$ [9] = 123.32, p < .001), but we

Table 3. Structural equation modeling results for main effects

	Model 1 Base model			Model 2 Mothers only			Model 3 Fathers only			Model 4 Mothers and fathers		
	B	SE	β	b	SE	β	b	SE	β	b	SE	β
Intercept	3.45***	0.06	3.55***	3.42***	0.06	3.51***	3.44***	0.06	3.54***	3.41***	0.06	3.51***
Age	–0.04	0.03	–0.05	–0.02	0.03	–0.02	–0.02	0.03	–0.03	–0.01	0.03	–0.01
Ethnocultural background	0.02	0.05	0.01	0.03	0.05	0.01	0.03	0.05	0.02	0.03	0.05	0.02
Education level	–0.10	0.06	–0.05	–0.06	0.06	–0.03	–0.09	0.06	–0.04	–0.05	0.06	–0.02
IP	–0.05***	0.00	–0.50***	–0.05***	0.00	–0.42***	–0.05***	0.00	–0.45***	–0.04***	0.00	–0.40***
Mother RQ				0.26***	0.04	0.21***				0.22***	0.04	0.18***
Father RQ							0.16***	0.03	0.16***	0.10**	0.03	0.10**
R^2		.26*			.29*			.28*			.30*	

SE, standard error; IP, internalizing problems; RQ, relationship quality. R^2 = explained variance in adolescents' well-being. *$p < .05$, **$p < .01$, ***$p < .001$.

found no significant difference between boys and girls after the fixing of regressions. Thus, these analyses revealed no difference in the main associations between boys and girls.

Table 4. Goodness-of-fit indices for models 1–6

Model	χ^2	df	*p*	RMSEA	90% CI RMSEA	CFI	SRMR
Model 1	3.92	1	.048	.05	.00-.11	.99	.01
Model 2	3.93	1	.047	.05	.01-.11	1.00	.01
Model 3	3.98	1	.046	.05	.01-.11	.99	.01
Model 4	3.98	1	.046	.05	.01-.11	1.00	.01
Model 5	3.98	1	.046	.05	.01-.11	1.00	.01
Model 6	4.00	1	.046	.05	.01-.11	1.00	.01

χ^2 = Santorra-Bentler chi-squared test, df = degrees of freedom, CI = confidence interval, RMSEA = root mean square error of approximation, CFI = comparative fit index, SRMR = standardized root mean square residual. Criteria for good model fit are: RSMEA < .06, CFI > .95, and SRMR ≤ .08.

DISCUSSION

To the best of our knowledge, no studies have investigated whether the well-established negative association between internalizing problems and well-being applies to boys and girls equally, and what potential buffering role parents play in this association. The present study addressed this gap and: 1) investigated the main associations of internalizing problems and the quality of mother– and father–adolescent relationships with adolescents' well-being, 2) explored the buffering role of high-quality mother– and father–adolescent relationships in the association between internalizing problems and well-being, and 3) examined differences in these main and buffering effects between boys and girls.

Adolescents with more internalizing problems reported lower levels of well-being, in accordance with our expectations based on previous research (Bartels et al., 2013; Lyons et al., 2013). The quality of adolescents' relationships with mothers and fathers had no buffering effect on this association. We found no significant interaction between internalizing problems and mother– or father–adolescent relationship quality in the effect on adolescents' well-being. Thus, the data do not support the hypothesis that a high-quality relationship with one parent compensates for a low-quality relationship with the other parent (compensation model) or the hypothesis that high-quality relationships with both parents are more beneficial than a single high-quality parental relationship (additive model). Previous research has yielded mixed results regarding the study buffer hypotheses, and analyses that have revealed significant buffering effects of parent–adolescent relationship quality have had small effect sizes (Lakey & Orehek,

2011). Possible explanations for the lack of buffering effect include the use of different instruments to measure the same constructs and the low variability of risk factor (internalizing problems) scores (Cohen & Wills, 1985). Our sample was a general school population of non-clinical adolescents, most of whom had few internalizing problems, good relationships with their parents, and high well-being levels. The results might differ for adolescents with (sub-)clinical levels of internalizing problems and lower-quality relationships with their parents (Cohen & Wills, 1985). We thus recommend additional research examining similar hypotheses with other adolescent samples, including (sub-) clinical samples, to determine whether the current findings can be replicated.

Although theory suggests the importance of the buffering effects of high-quality relationships, more empirical support exists for their main effects (for a review, see Lakey & Orehek, 2011). Indeed, our results revealed that adolescents with higher-quality relationships with their mothers and fathers reported higher levels of well-being, even after controlling for internalizing problems. We also found that the relation between the quality of mother–adolescent relationships and adolescents' well-being was significantly stronger than that between father–adolescent relationship quality and adolescents' well-being. This finding suggests the importance of investigating the effects of both parents on adolescents' well-being, supporting our expectations based on family systems theory (e.g., Cox & Paley, 1997) and previous research (Chu et al., 2010; Moak & Agrawal, 2010; Wang et al., 2019). Adolescence is characterized by social transformations, among others (Steinberg & Morris, 2001), and research suggests that the relative roles of mothers and fathers change between adolescence and young adulthood (Wang et al., 2019). Thus, future research should investigate the unique roles of mothers and fathers with respect to adolescents' internalizing problems and well-being over time.

We found that girls had more internalizing problems and lower well-being than did boys, in line with previous findings (Bartels et al., 2013; Smith et al., 2015; Stevens et al., 2018). In contrast to previous research, in which girls reported higher-quality relationships with their mothers and fathers than did boys (Van Eijck et al., 2012), we found that boys had higher-quality relationships with both parents than did girls. This finding may be explained by girls' experience of greater changes, such as increased conflict (Simon & Furman, 2010), in their relationships with their mothers and fathers, relative to boys. For instance, among adolescents aged 12–18 years in the United States' New England region, girls perceived stronger increases in alienation from both parents and stronger declines in trust with mothers than did boys (Ebbert et al., 2019).

Although we found gender differences in the mean levels of internalizing problems, well-being, and mother–, and father–adolescent relationship quality, structural equation modeling revealed no gender difference in a main or buffering effect on adolescents' well-being. Fewer internalizing problems and higher-quality relationship with parents were associated significantly with greater well-being among boys and girls. To better understand the roles of parents in the relationship between adolescent boys' and girls' internalizing problems and well-being, future research could focus on aspects of parent–adolescent relationships other than quality, such as effects on adolescents' emotion regulation pathways. The importance of studying parental depressive symptoms has been demonstrated, as these symptoms may interfere with parents' ability to take care of their children (Vismara et al., 2019). In response, adolescents may have dissociative experiences and internalizing problems, which in turn lead parents to commit affective communication errors, including contradictory signaling and failure to initiate responsive behavior to their children's cues. Such maternal and paternal behaviors in the parental dyad may have cumulative negative effects on adolescents' development (Vismara et al., 2019).

The present study was strengthened by the use of a large, culturally diverse sample of adolescents, distinction between mother– and father–adolescent relationships, and the inclusion of positive and negative aspects of social relationship quality. Our findings contribute to the existing literature and increase our understanding of the negative association between internalizing problems and well-being that applies to boys and girls regardless of the quality of adolescents' relationships with their mothers or fathers. However, some limitations of this study need to be considered. First, the analysis of cross-sectional questionnaire data does not permit determination of the directionality or causality of associations among variables. In addition, as the prevalence of internalizing problems is known to increase throughout adolescence (Bor et al., 2014; Costello et al., 2011), longitudinal data are required to advance our understanding of individual and longitudinal changes in relationships between adolescents' internalizing problems and well-being, as well as possible changes in the roles of parents over time. We also recommend additional (longitudinal) studies with larger samples to examine the potential buffering roles of high-quality mother– and father–adolescent relationships on adolescents' internalizing problems and well-being in greater depth and with sufficient power (to detect three-way interactions).

Second, our results were based on adolescents' self-reports, and are thus subject to potential response bias. For example, although our participants reported few internalizing problems overall, adolescents with more such problems may have answered questions about the quality of their relationships with their parents and their

well-being differently (e.g., more negatively) in comparison with adolescents with no internalizing problems (De Los Reyes et al., 2008).

Third, although this study built on family systems theory (Cox & Paley, 1997), we assessed only adolescents' relationships with their mothers and fathers, and not, for instance, relationships between parents or of adolescents with their siblings. In addition, despite substantial support for the reliability and predictive utility of adolescents' self-reports about their relationships with their parents (Metzler, 1998), future research may benefit from the inclusion of reports from other actors in multiple family subsystems (e.g., parents) to more fully capture adolescents' relationships or interactions with their family members and effects on their internalizing problems and well-being.

Fourth, although parents are important proximal socializing agents, young people expand their interpersonal networks and place greater emphasis on peer relationships, particularly friendships, in adolescence (De Goede et al., 2009). Peer relationships have been found to be important to adolescents' well-being (Raboteg-Šarić et al., 2014). In addition, theoretical and empirical research has demonstrated the value of considering independent and joint effects of relationships from different contexts (e.g., family members and peers) in the examination of adolescents' well-being (Llorca et al., 2017; Sechi et al., 2020). Thus, future studies of the association between adolescents' internalizing problems and well-being should include consideration of the role of peer relationships.

Finally, participants in this study were younger than excluded students, which may have influenced our results despite the control for age in our analyses. Also, Dutch adolescents are, on average, among the happiest and most satisfied with their lives of adolescents worldwide (Stevens et al., 2018). Thus, results might differ in other populations and countries where adolescents do not experience similar levels of well-being. To test the generalizability of our findings, this study should be replicated with adolescents throughout the Netherlands and in other countries.

CONCLUSIONS

In this study, adolescent boys and girls with more internalizing mental health problems reported lower well-being, regardless of the quality of their relationships with their mothers and fathers. Nonetheless, higher-quality relationships with both mothers and fathers were related significantly to higher well-being of adolescents, even in the presence of internalizing problems. Higher-quality mother–adolescent relationships

were associated with even higher levels of adolescents' well-being than father–adolescent relationships of similar quality. These findings may contribute to future public health policy making, as adolescents' internalizing problems and well-being are increasingly being recognized as major priorities (Parkin et al., 2019; World Health Organization, 2012). Prevention and intervention programs that aim to enhance the well-being of adolescents with internalizing problems may be improved by the inclusion of strategies to help adolescents achieve or maintain high-quality relationships with their mothers and fathers (Bronfenbrenner, 1979).

REFERENCES

Antaramian, S. P., Huebner, E. S., Hills, K. J., & Valois, R. F. (2010). A dual-factor model of mental health: Toward a more comprehensive understanding of youth functioning. *American Journal of Orthopsychiatry, 80*(4), 462–472. https://doi.org/10.1111/j.1939-0025.2010.01049.x

Bartels, M., Cacioppo, J. T., Van Beijsterveldt, T. C., & Boomsma, D. I. (2013). Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetics, 43*(3), 177-190. https://doi.org/10.1007/s10519-013-9589-7

Bentler, P., & Bonett, D. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588-606. https://doi.org/10.1037/0033-2909.88.3.588

Bor, W., Dean, A. J., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal of Psychiatry, 48*(7), 606-616. https://doi.org/10.1177/0004867414533834

Branje, S. J., Hale, W. W., Frijns, T., & Meeus, W. H. (2010). Longitudinal associations between perceived parent–child relationship quality and depressive symptoms in adolescence. *Journal of Abnormal Child Psychology, 38*(6), 751-763. https://doi.org/10.1007/s10802-010-9401-6

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design.* Cambridge, MA: Harvard University Press.

Cabrera, N. J., Fitzgerald, H. E., Bradley, R. H., & Roggman, L. (2014). The ecology of father-child relationships: An expanded model. *Journal of Family Theory & Review, 6*(4), 336-354. https://doi.org/10.1111/jftr.12054

Chu, P. S., Saucier, D. A., & Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *Journal of Social and Clinical Psychology,*29(6), 624-645. https://doi.org/10.1521/jscp.2010.29.6.624

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin,98*, 310-357. https://doi.org/10.1037/0033-2909.98.2.310

Costello, E. J., Copeland, W., & Angold, A. (2011). Trends in psychopathology across the adolescent years: what changes when children become adolescents, and when adolescents become adults?. *Journal of Child Psychology and Psychiatry, 52*(10), 1015-1025. https://doi.org/10.1111/j.1469-7610.2011.02446.x

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology, 48*(1), 243-267. https://doi.org/10.1146/annurev.psych.48.1.243

De Goede, I. H., Branje, S. J., & Meeus, W. H. (2009). Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth and Adolescence, 38*(1), 75-88. https://doi.org/10.1007/s10964-008-9286-7

De Los Reyes, A., Goodman, K. L., Kliewer, W., & Reid-Quinones, K. (2008). Whose depression relates to discrepancies? Testing relations between informant characteristics and informant discrepancies from both informants' perspectives. *Psychological Assessment, 20*(2), 139-149. https://doi.org/10.1037/1040-3590.20.2.139

Diener, E. (2009). Subjective well-being. In: E. Diener (Ed.), *The science of well-being* (pp. 11-58). Social Indicators Research Series, vol 37. Dordrecht: Springer.

Ebbert, A. M., Infurna, F. J., & Luthar, S. S. (2019). Mapping developmental changes in perceived parent–adolescent relationship quality throughout middle school and high school. *Development and Psychopathology*, *31*(4), 1541-1556. https://doi.org/10.1017/S0954579418001219

Ebesutani, C., Reise, S. P., Chorpita, B. F., Ale, C., Regan, J., Young, J., Higa-McMillan, C., & Weisz, J. R. (2012). The Revised Child Anxiety and Depression Scale-Short Version: Scale reduction via exploratory bifactor modeling of the broad anxiety factor. *Psychological Assessment*, *24*(4), 833-845. https://doi.org/10.1037/a0027283

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*, *8*(3), 430-457. https://doi.org/10.1207/S15328007SEM0803_5

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175-191. https://doi.org/10.3758/BF03193146

Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual Review of Public Health*, *26*, 399-419. https://doi.org/10.1146/annurev.publhealth.26.021304.144357

Flouri, E. (2010). Fathers' behaviors and children's psychopathology. *Clinical Psychology Review*, *30*(3), 363-369. https://doi.org/10.1016/j.cpr.2010.01.004

Furman, W., & Buhrmester, D. (2009). Methods and measures: The network of relationships inventory: Behavioral systems version. *International Journal of Behavioral Development*, *33*(5), 470-478. https://doi.org/10.1177%2F0165025409342634

Gallagher, M. W., Lopez, S. J., & Preacher, K. J. (2009). The hierarchical structure of well-being. *Journal of Personality*, *77*(4), 1025-1050. https://doi.org/10.1111/j.1467-6494.2009.00573.x

Garber, J., & Weersing, V. R. (2010). Comorbidity of anxiety and depression in youth: Implications for treatment and prevention. *Clinical Psychology: Science and Practice*, *17*(4), 293–306. https://doi.org/10.1111/j.1468-2850.2010.01221.x

Gore, F. M., Bloem, P. J., Patton, G. C., Ferguson, J., Joseph, V., Coffey, C., ... & Mathers, C. D. (2011). Global burden of disease in young people aged 10–24 years: a systematic analysis. *The Lancet*, *377*(9783), 2093-2102. https://doi.org/10.1016/S0140-6736(11)60512-6

Greenspoon, P. J., & Saklofske, D. H. (2001). Toward an integration of subjective well-being and psychopathology. *Social Indicators Research*, *54*(1), 81-108. https://doi.org/10.1023/A:1007219227883

Guo, C., Tomson, G., Keller, C., & Söderqvist, F. (2018). Prevalence and correlates of positive mental health in Chinese adolescents. *BMC Public Health*, *18*, 263. https://doi.org/10.1186/s12889-018-5133-2

Hale, W. W., Nelemans, S. A., Meeus, W. H., & Branje, S. J. (2020). A 6-year longitudinal study of adolescents and mothers depression symptoms and their perception of support and conflict. *Child Psychiatry & Human Development*, *51*(3), 407-415. https://doi.org/10.1007/s10578-019-00952-y

Haworth, C. M., Carter, K., Eley, T. C., & Plomin, R. (2017). Understanding the genetic and environmental specificity and overlap between well-being and internalizing symptoms in adolescence. *Developmental Science*, *20*(2), e12376. https://doi.org/10.1111/desc.12376

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Keizer, R., Helmerhorst, K. O., & Van Rijn-van Gelderen, L. (2019). Perceived quality of the mother–adolescent and father–adolescent attachment relationship and adolescents' self-esteem. *Journal of Youth and Adolescence*, *48*(6), 1203-1217. https://doi.org/10.1007/s10964-019-01007-0

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Klaufus, L., Verlinden, E., Van Der Wal, M., Kösters, M., Cuijpers, P., & Chinapaw, M. (2020). Psychometric evaluation of two short versions of the Revised Child Anxiety and Depression Scale. *BMC Psychiatry*, *20*(1), 1-12. https://doi.org/10.1186/s12888-020-2444-5

Kriesi, I., Buchmann, M., & Jaberg, A. (2012). Educational success and adolescents' well-being in Switzerland. *Schweizerische Zeitschrift für Soziologie = Revue Suisse de Sociologie = Swiss Journal of Sociology*, *38*(2), 245-265. https://doi.org/10.5167/uzh-68739

Lakey, B., & Orehek, E. (2011). Relational regulation theory: a new approach to explain the link between perceived social support and mental health. *Psychological review*, *118*(3), 482-295. https://doi.org/10.1037/a0023477

Lewis, C., & Lamb, M. E. (2003). Fathers' influences on children's development: The evidence from two-parent families. *European Journal of pPychology of Education*, *18*(2), 211-228. https://doi.org/10.1007/BF03173485

Llorca, A., Cristina Richaud, M., & Malonda, E. (2017). Parenting, peer relationships, academic self-efficacy, and academic achievement: Direct and mediating effects. *Frontiers in Psychology*, *8*, 2120. https://doi.org/10.3389/fpsyg.2017.02120

Luijten, C. C., Kuppens, S., Van de Bongardt, D., & Nieboer, A. P. (2019). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Dutch adolescents. *Health and Quality of Life Outcomes*, *17*(1), 157. https://doi.org/10.1186/s12955-019-1221-y

Lyons, M. D., Huebner, E. S., Hills, K. J., & Van Horn, M. L. (2013). Mechanisms of change in adolescent life satisfaction: A longitudinal analysis. *Journal of School Psychology*, *51*(5), 587-598. https://doi.org/10.1016/j.jsp.2013.07.001

Markham, C. M., Lormand, D., Gloppen, K. M., Peskin, M. F., Flores, B., Low, B., & House, L. D. (2010). Connectedness as a predictor of sexual and reproductive health outcomes for youth.*Journal of Adolescent Health,46*, S23-S41. https://doi.org/10.1016/j.jadohealth.2009.11.214

McHale, S. M., Crouter, A. C., & Whiteman, S. D. (2003). The family contexts of gender development in childhood and adolescence. *Social Development, 12*, 125-148. https://doi.org/10.1111/1467-9507.00225

Merrell, K. W. (2008). Understanding internalizing problems: Depression and anxiety in children and adolescents. In K. W. Merrel, *Helping students overcome depression and anxiety, second edition: A practical guide* (pp. 1-18). New York: The Guilford Press.

Metzler, C. W., Biglan, A., Ary, D. V., & Li, F. (1998). The stability and validity of early adolescents' reports of parenting constructs. *Journal of Family Psychology*, *12*(4), 600-619. https://doi.org/10.1037/0893-3200.12.4.600

Moak, Z. B., & Agrawal, A. (2010). The association between perceived interpersonal social support and physical and mental health: results from the National Epidemiological Survey on Alcohol and Related Conditions. *Journal of Public Health, 32*(2), 191-201. https://doi.org/10.1093/pubmed/fdp093

Nogueira Avelar E Silva, R., Van de Bongardt, D., Van de Looij-Jansen, P., Wijtzes, A., & Raat, H. (2016). Mother–and father–adolescent relationships and early sexual intercourse.*Pediatrics*,138(6), e20160782. https://doi.org/10.1542/peds.2016-0782

Parkin, E., Long, R., & Gheera, M. (2019). Children and young people's mental health: policy, services, funding and education (No. 07196). House of Commons Library. Retrieved September 10, 2020 from: https://dera.ioe.ac.uk/30819/1/CBP-7196%20_Redacted.pdf

Piqueras, J. A., Martín-Vivar, M., Sandin, B., San Luis, C., & Pineda, D. (2017). The Revised Child Anxiety and Depression Scale: A systematic review and reliability generalization meta-analysis. *Journal of Affective Disorders*, *218*, 153-169. https://doi.org/10.1016/j.jad.2017.04.022

Pleck, J. H., & Masciadrelli, B. P. (2004). Paternal involvement by US residential fathers: Levels, sources, and consequences. In M. E. Lamb (Ed.), *The role of the father in child development* (pp. 222-271). New York, NY: Wiley.

Plenty, S., Östberg, V., Almquist, Y. B., Augustine, L., & Modin, B. (2014). Psychosocial working conditions: An analysis of emotional symptoms and conduct problems amongst adolescent students. *Journal of Adolescence*, *37*(4), 407-417. https://doi.org/10.1016/j.adolescence.2014.03.008

Raboteg-Šarić, Z., & Šakić, M. (2014). Relations of parenting styles and friendship quality to self-esteem, life satisfaction and happiness in adolescents. *Applied Research in Quality of Life*, *9*, 749-765. https://doi.org/10.1007/s11482-013-9268-0

Reitz, E., Deković, M., & Meijer, A. M. (2005). The structure and stability of externalizing and internalizing problem behavior during early adolescence. *Journal of Youth and Adolescence*, *34*(6), 577-588. https://doi.org/10.1007/s10964-005-8947-z

Rosenthal, N. L., & Kobak, R. (2010). Assessing adolescents' attachment hierarchies: Differences across developmental periods and associations with individual adaptation. *Journal of Research on Adolescence*, *20*(3), 678-706. https://doi.org/10.1111/j.1532-7795.2010.00655.x

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software*, *48*, 1-36. Retrieved from: https://users.ugent.be/~yrosseel/lavaan/lavaanIntroduction.pdf

Salmela-Aro, K., & Tynkkynen, L. (2010). Trajectories of life satisfaction across the transition to post-compulsory education: Do adolescents follow different pathways?. *Journal of Youth and Adolescence*, *39*(8), 870-881. https://doi-org.eur.idm.oclc.org/10.1007/s10964-009-9464-2

Sass, D. A., Schmitt, T. A., & Marsh, H. W. (2014). Evaluating model fit with ordered categorical data within a measurement invariance framework: A comparison of estimators. *Structural Equation Modeling: A Multidisciplinary Journal*, *21*(2), 167-180. https://doi.org/10.1080/10705511.2014.882658

Scholten, W. D., Batelaan, N. M., van Balkom, A. J., Penninx, B. W., Smit, J. H., & van Oppen, P. (2013). Recurrence of anxiety disorders and its predictors. *Journal of Affective Disorders*, *147*(1-3), 180-185. https://doi.org/10.1016/j.jad.2012.10.031

Sechi, C., Vismara, L., & Lucarelli, L. (2020). Attachment to parents and peers and adolescent mental health: the mediating role of alexithymia. *Community Mental Health Journal*, *56*(5), 894-905. https://doi.org/10.1007/s10597-020-00553-3

Shieh, G. (2009). Detecting interaction effects in moderated multiple regression with continuous variables power and sample size considerations. *Organizational Research Methods*, *12*(3), 510-528. https://doi.org/10.1177/1094428108320370

Shieh, G. (2010). Sample size determination for confidence intervals of interaction effects in moderated multiple regression with continuous predictor and moderator variables. *Behavior Research Methods*, *42*(3), 824-835. https://doi.org/10.3758/BRM.42.3.824

Simon, V. A., & Furman, W. (2010). Interparental conflict and adolescents' romantic relationship conflict. *Journal of Research on Adolescence*, *20*(1), 188-209. https://doi.org/10.1111/j.1532-7795.2009.00635.x

Smith, N. R., Lewis, D. J., Fahy, A., Eldridge, S., Taylor, S. J., Moore, D. G., ... & Cummins, S. (2015). Individual socio-demographic factors and perceptions of the environment as determinants of inequalities in adolescent physical and psychological health: the Olympic Regeneration in East London (ORiEL) study. *BMC Public Health*, *15*(1), 150. https://doi.org/10.1186/s12889-015-1459-1

Song, H., Thompson, R. A., & Ferrer, E. (2009). Attachment and self-evaluation in Chinese adolescents: Age and gender differences.*Journal of Adolescence*,*32*(5), 1267-1286. https://doi.org/10.1016/j.adolescence.2009.01.001

Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Journal of Cognitive Education and Psychology*, *2*(1), 55-87. https://doi.org/10.1891/194589501787383444

Stevens, G. W. J. M., Van Dorsselaer, S., Boer, M., de Roos, S., Duinhof, E. L., ter Bogt, T. F. M., ... & de Looze, M. (2018). *HBSC 2017. Gezondheid en welzijn van jongeren in Nederland.* Retrieved from https://hbsc-nederland.nl/wp-content/uploads/2018/09/Rapport-HBSC-2017.pdf

Suldo, S. M., & Shaffer, E. J. (2008). Looking beyond psychopathology: the dual-factor model of mental health in youth. *School Psychology Review, 37*(1), 52-68. https://doi.org/10.1080/02796015.2008.12087908

Vacek, K. R., Coyle, L. D., & Vera, E. M. (2010). Stress, self-esteem, hope, optimism, and well-being in urban, ethnic minority adolescents. *Journal of Multicultural Counseling and Development*, *38*(2), 99-111. https://doi.org/10.1002/j.2161-1912.2010.tb00118.x

Van de Bongardt, D., De Graaf, H., Reitz, E., & Deković, M. (2014). Parents as moderators of longitudinal associations between sexual peer norms and Dutch adolescents' sexual initiation and intention. *Journal of Adolescent Health*, *55*(3), 388-393. https://doi.org/10.1016/j.jadohealth.2014.02.017

Van Eijck, F. E., Branje, S. J., Hale, W. W., & Meeus, W. H. (2012). Longitudinal associations between perceived parent–adolescent attachment relationship quality and generalized anxiety disorder symptoms in adolescence. *Journal of Abnormal Child Psychology*, *40*(6), 871-883. https://doi.org/10.1007/s10802-012-9613-z

Vismara, L., Sechi, C., & Lucarelli, L. (2019). Fathers' and mothers' depressive symptoms: Internalizing/externalizing problems and dissociative experiences in their adolescent offspring. *Current Psychology*, *41*, 247-257. https://doi.org/10.1007/s12144-019-00566-6

Wang, Z., Kouvonen, A., Satka, M., & Julkunen, I. (2019). Parental social support and adolescent well-being: a cross-sectional study in China.*Child Indicators Research*,*12*, 299-317. https://doi.org/10.1007/s12187-018-9547-2

World Health Organization. (2012). Adolescent mental health: mapping actions of nongovernmental organizations and other international development organizations. Retrieved May 5, 2022, from https://apps.who.int/iris/bitstream/handle/10665/44875/9789241503648_eng.pdf

Yuan, K. H., & Bentler, P. M. (2000). 5. Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology*, *30*, 165-200. https://doi.org/10.1111%2F0081-1750.00078

Yucel, D., & Yuan, A. S. V. (2016). Parents, siblings, or friends? Exploring life satisfaction among early adolescents. *Applied Research in Quality of Life, 11*(4), 1399-1423. https://doi.org/10.1007/s11482-015-9444-5

Zhang, S., Baams, L., Van de Bongardt, D., & Dubas, J. S. (2018). Intra-and inter-individual differences in adolescent depressive mood: The role of relationships with parents and friends. *Journal of Abnormal Child Psychology, 46*(4), 811-824. https://doi.org/10.1007/s10802-017-0321-6

4

Longitudinal associations among adolescents' internalizing problems, well-being, and the quality of their relationships with their mothers, fathers, and close friends

This paper was published as:
Luijten, C. C., Van de Bongardt, D., Jongerling, J., & Nieboer, A. P. (2021). Longitudinal associations among adolescents' internalizing problems, well-being, and the quality of their relationships with their mothers, fathers, and close friends. Social Science & Medicine, 289, 114387. https://doi.org/10.1016/j.socscimed.2021.114387

ABSTRACT

Background

Internalizing problems (i.e., depressive and anxiety symptoms) are known to decrease adolescents' well-being, but knowledge about potential underlying mechanisms is limited. The qualities of adolescents' most proximal relationships with their parents and close friends are expected to play a role in the association between adolescents' internalizing problems and well-being. The present study was conducted to 1) investigate the indirect longitudinal association between internalizing problems and adolescents' well-being via the quality of adolescents' relationships with both their mothers and fathers and their close friends, and 2) test whether our findings were gender invariant.

Methods

Data were collected via online questionnaires in two waves at a 12-month interval from adolescents attending three secondary schools in the Netherlands (N = 1,298 M_{age} = 13.7 years, 53.2% girls). The data were analyzed using a two-wave cross-lagged panel model in R. Multigroup analyses were performed to examine the gender invariance of the findings.

Results

After controlling for baseline levels, results showed that (1) girls, but not boys, who reported more internalizing problems at T1 had lower well-being at T2; (2) girls and boys who reported more internalizing problems at T1 had lower-quality relationships with their mothers, fathers, and close friends at T2; and (3) boys, but not girls, who reported higher-quality friendships at T1 had higher well-being at T2. However, no significant indirect effects between internalizing problems and well-being via the quality of adolescents' relationships with their parents and close friends were detected.

Conclusions

The current study contributes to understanding internalizing problems as an important risk factor to the quality of adolescents' proximal social relationships (parents, friends) and their well-being. The findings support the importance of building high-quality relationships, particularly friendships, and recommend future research to study adolescents' internalizing problems and well-being including gender-specific examinations.

INTRODUCTION

The increased prevalence of internalizing problems (i.e., depressive and anxiety symptoms) during adolescence is well documented (for reviews, see Bor et al., 2014; Costello et al., 2011). Research has also consistently shown that adolescents with more internalizing problems have lower well-being, both concurrently (Bartels et al., 2013) and longitudinally (Lyons et al., 2013). Well-being is a multidimensional construct defined as a combination of a hedonic conception, focusing on, for instance, happiness, positive emotions, and satisfaction with life, and a eudaimonic conception, comprising good functioning in one's individual endeavors and social life (Diener, 2009; Gallagher et al., 2009). Adolescents' internalizing problems can manifest into (young) adulthood and lead to adverse outcomes throughout their lives (for reviews, see Bor et al., 2014; Costello et al., 2011), but knowledge of the mechanisms potentially underlying this association is limited.

Most previous studies have focused primarily on the identification of direct relationships between internalizing problems and well-being (e.g., Bartels et al., 2013; Lyons et al., 2013), and thus focusing merely on mechanisms that occur within persons. However, internalizing problems may also be associated with the well-being of adolescents indirectly, through mechanisms that occur between persons, as adolescents also have continuous interactions within their social environment. Empirical research has indeed shown that adolescents' internalizing problems and well-being are intertwined with their social relationships (Young & Mufson, 2008), and specifically with their perceptions of the *quality* of these relationships (e.g., Branje et al., 2010; Miething et al., 2016). Relationship quality is generally characterized by positive (e.g., level of warmth) and negative (e.g., level of conflict) aspects (Furman & Buhrmester, 2009). For instance, internalizing problems can intensify adolescents' perception of negative aspects of social relationship, such as interpersonal difficulties (Rudolph et al., 2009), even leading to social withdrawal (Boivin et al., 1995; Flynn & Rudolph, 2014).

Being the most proximal social contacts, the quality of adolescents' relationships with parents and close friends is particularly important (Bronfenbrenner & Morris, 2006; Smetana et al., 2006). Up to now, direct links among adolescents' internalizing problems, the quality of relationships with parents and (close) friends, and well-being have been investigated separately. Empirical longitudinal research has shown that adolescents with more internalizing problems report lower-quality parent–adolescent relationships one and two years later (Branje et al., 2010), and lower-quality friendships two years later (Kochel et al., 2012). Additionally, the importance of high-quality relationships with parents and close friends for adolescents' well-being is theoretically and empirically

recognized (for a meta-analysis, see Chu et al., 2010). Theoretically, high-quality social relationships are resources that allow the realization of well-being (Kesebir & Diener, 2009; Nieboer & Lindenberg, 2002). Empirically, it has been confirmed that adolescents with higher-quality relationships with parents and friends tend to experience higher well-being than adolescents with lower-quality relationships with parents and friends (Chu et al., 2010; Raboteg-Šarić & Šakić, 2014).

While the literature discussed above is relevant to understanding the direct associations among internalizing problems, social relationship quality, and well-being, the theoretical expectation that internalizing problems are associated with adolescents' well-being indirectly through the quality of proximal social relationships has not yet been examined. Several studies investigating indirect effects among different associations have suggested an explanatory role of parent–adolescent relationship and friendship quality. For example, a cross-sectional study showed that high-quality relationships with family members and friends partially explained the association between depressive symptoms and self-reported quality of life in adults receiving hemodialysis (Khalil & Abed, 2014). This finding suggests that internalizing problems (in this case only depressive symptoms) are indirectly related to well-being (measured as quality of life) via decreased social relationship quality. However, whether and how such findings can be generalized to younger, non-clinical populations remains unclear. We found a few studies conducted among adolescents that examined indirect effects via relationships with parents and close friends, but these assessed different risk factors and outcomes, e.g., between relational aggression and social-psychological adjustment, which included depressive symptoms (Kamper & Ostrov, 2013), or between stressful life events and psychological distress (Dinizulu et al., 2014). The indirect associations between internalizing problems and well-being via quality of adolescents' relationships with their parents and close friends have not yet been investigated.

Therefore, the present study examined the longitudinal indirect association between adolescents' internalizing problems and well-being via the quality of parent–adolescent relationships and close friendships. Close friendships are distinguished from general friendships, characterized by reciprocal disclosures, similarities in life stages and interests, and sharing activities, by secret-sharing and intimacy (Finkenauer & Righetti, 2011; Way, 2013). We focused on parents and close friends because they are important in adolescents' social worlds, notwithstanding the typical reduction in the amount of time spent with parents and substantial increase in the amount of time spent with peers during adolescence (Bokhorst et al., 2010; De Goede et al., 2009; Gorrese & Ruggieri, 2012). In addition, the simultaneous investigation of multiple social actors makes sense theoretically, as adolescents develop through continuous interactions with such actors

(Bronfenbrenner & Morris, 2006). According to the family systems theory (e.g., Cox & Paley, 1997), families consist of not merely one but several subsystems, including various dyadic family relationships (e.g., mother–child, father–child) that are partly independent and partly interdependent, and as such continuously and reciprocally affect one another. In the present study, we specifically distinguished between adolescents' relationships with mothers and fathers, as research increasingly shows that mothers and fathers play unique roles in the development of children and adolescents (Keizer et al., 2019; Lewis & Lamb, 2003; Nogueira Avelar E Silva et al., 2016).

We hypothesized that adolescents with more internalizing problems would report (1) lower well-being (Bartels et al., 2013) and (2) lower-quality relationships with mothers, fathers, and close friends one year later (Branje et al., 2010; Kochel et al., 2012); (3) that higher-quality relationships with mothers, fathers, and close friends would predict adolescents' greater well-being one year later (Chu et al., 2010; Raboteg-Šarić & Šakić, 2014); and (4) that internalizing problems would be indirectly associated with adolescents' well-being through the quality of adolescents' relationships with their mothers, fathers, and close friends (Dinizulu et al., 2014; Kamper & Ostrov, 2013; Khalil & Abed, 2014). An additional aim of the current study was to test whether our findings were gender invariant given the consistently observed gender differences in internalizing problems (Bartels et al., 2013; Stevens et al., 2018), the qualities of relationships with mothers, fathers, and close friends (Schwartz-Mette et al., 2020; Van Eijck et al., 2012), and well-being (Stevens et al., 2018). As neither theory nor empirical findings indicate clear gender differences in the hypothesized linkages among internalizing problems, social relationship quality with parents and close friends, and well-being, no differences were expected (e.g., Long et al., 2020, Miething et al., 2016).

METHODS

Participants and consent

The current study was part of a two-wave longitudinal study of adolescents' mental health and well-being. Data were collected from adolescents attending three secondary schools in the Netherlands at a 12-month interval (T1 = spring 2018 [grades 7–9], T2 = spring 2019 [grades 7–10]). The participating secondary schools provided active informed consent to the adolescents' participation. At T1 and T2, the adolescents and their parents or guardians received informational letters by email describing the study aims and procedure, the rights to voluntary participation, and confidentiality of data. Informed consent was taken from the parents/guardians as all participants were minors (under 18 years old) at both timepoints. Upon parental or guardian consent, informed

consent from adolescents was obtained separately; the adolescents provided face-to-face consent and were allowed to decline participation or withdraw from the study at any time. In total, 6.2% of contacted parents (*n* = 84) and 1.0% of adolescents (*n* = 13) used this opportunity to decline. At T2, parents and adolescents were informed about the study again and had the same opportunity to decline participation. No parents used this opportunity, compared to 0.8% of adolescents (*n* = 11).

The total sample consisted of 1,304 adolescents (mean age 13.8 ± 1.1 years, 53.0% girls). At T1, the sample consisted of 1,124 adolescents in grades 7–9 (mean age 13.7 ± 1.1 years, 53.3% girls). At T2, 1,055 adolescents in grades 7–10 (mean age 14.6 ± 1.1 years, 55.0% girls) participated, and 875 (81.6%) of these adolescents had also participated at T1. For the present study, we only excluded participants with missing data on all variables of interest (*n* = 6). Consequently, the final analysis sample consisted of 1,298 adolescents (mean age 13.7 ± 1.1 years, 53.2% girls). Most (73.3%) participants were enrolled in higher (i.e., senior general [HAVO] and pre-university [VWO]) education; 26.7% were enrolled in lower (i.e., pre-vocational [VMBO]) education. More than half (57.0%) of the participants had Western ethnocultural backgrounds (i.e., they and their parent[s] were born in Europe, the USA, Canada, Australia, or New Zealand); 43.0% of participants had non-Western backgrounds (i.e., they and/or their parent[s] were born in Africa, the Middle East, Asia, or Latin and South America).

Procedure

At T1 and T2, participants completed online questionnaires in the classroom during regular school hours. The lead researcher and trained research assistants were present during questionnaire administration; they introduced the study and procedure, answered questions, ensured participants' maximum privacy, and guaranteed that their responses were confidential. After completing the questionnaire at each timepoint, participants received small, non-financial incentives (e.g., candy) and a card listing websites with information about topics from the questionnaire and the contact information of the lead researcher in case they had questions. In addition, one gift (e.g., iPhone, PlayStation) per school and one gift card (€5–10, depending on grade) per class were raffled off to participants.

The medical ethics committee of the Erasmus Medical Centre, Rotterdam, the Netherlands, has reviewed the study's research proposal and decided that the rules laid down in the Medical Research Involving Human Subjects Act did not apply (protocol no. MEC-2018-055).

Measures

Well-being

We used the Mental Health Continuum-Short Form (Keyes, 2005) to measure adolescents' well-being. This 14-item inventory has been validated for use with Dutch adolescents (Luijten et al., 2019) and also showed good reliability in this study (Cronbach's α = 0.91 at T1 and 0.92 at T2). Using a six-point scale (0 = never, 5 = every day), respondents rated their degrees of emotional well-being (three items; e.g., "How often did you feel happy?"), psychological well-being (six items; e.g., "How often did you feel good at managing the responsibilities of your daily life?"), and social well-being (five items; e.g., "How often did you feel that you had something important to contribute to society?") in the past month. Mean total scores were calculated, with higher scores indicating greater well-being.

Internalizing problems

To measure internalizing problems, we used the Revised Child Anxiety and Depression Scale-25 (RCADS-25; Ebesutani et al., 2012). This 25-item inventory measures symptoms of anxiety (15 items; e.g., "I worry about things") and depression (10 items; e.g., "Nothing is much fun anymore") on a four-point scale (0 = never, 3 = always). Previous research confirmed the reliability and validity of the depression and anxiety subscales, and indicated that the total score (i.e., sum of the two subscale scores) was a reliable indicator of internalizing problems (Ebesutani et al., 2012). Higher total RCADS-25 scores indicate greater frequencies of depression and anxiety (symptoms of internalizing problems). In the current study, the RCADS-25 also showed good reliability (Cronbach's α = 0.91 at T1 and 0.92 at T2).

Parent–adolescent relationship and friendship quality

The quality of adolescents' relationships with their mothers, fathers, and close friends was measured using two subscales from the Network of Relationships Inventory (Furman & Buhrmester, 2009): satisfaction (three items; e.g., "How satisfied are you with the relationship with your mother/father/close friends?") and conflict (three items; e.g., "How much do you and your mother/father/close friends argue with each other?"). Item responses were provided on a six-point scale (1 = none, 6 = the most). The conflict subscale item scores were inverted so that higher scores reflected greater overall relationship quality, and total mother–, father–, and close friend–adolescent relationship quality scores were then calculated (Van de Bongardt et al., 2016; Verbeek et al., 2020). In our sample, we obtained Cronbach's α values of .89 for mothers, .90 for fathers, and .82 for close friends at T1, and .89 for mothers, .88 for fathers, and .81 for close friends at T2.

Statistical Analyses

Missing value analysis conducted with SPSS (version 27; IBM Corporation, Armonk, NY, USA) indicated that 13.9–22.7% of the total scores across variables and waves were missing, due largely to adolescents' absence at T1 or T2. The majority (95.1%) of participants reported that they had both parents and, thus, reported on the quality of their relationships with both parents. A minority (4.9%) did not, mainly because they reported that they had only a mother or a father. Little's missing completely at random test revealed that the distribution of missing values was not completely random ($\chi^2(128) = 174.47$, $p = .004$). Therefore, all analyses in R were performed using the full information maximum likelihood method (Enders & Bandalos, 2001). To account for nonnormality in the data, robust maximum likelihood estimation was used, which corrects for deviations from multivariate normality by computing robust standard errors and adjusted chi-square values (Sass et al., 2014; Yuan & Bentler, 2000). For all analyses, the alpha level was set to 5.0%.

Descriptive statistics were calculated for all variables using SPSS (version 27; IBM Corporation, Armonk, NY, USA). Independent-samples *t* tests were performed to compare the mean scores on internalizing problems, relationship quality with mothers, fathers, and close friends, and well-being between boys and girls. Paired-samples *t* tests were performed to compare the mean scores on all variables of interest between T1 and T2. Bivariate correlations were assessed using Pearson correlation coefficients; *r* values of .10–.29 were considered to be low and those of .30–.49 and ≥.50 were considered to be moderate and high, respectively (Cohen, 1988).

The study hypotheses were tested using a two-wave cross-lagged panel model (Figure 1) in R (version 4.0.3; R Core Team), and the *lavaan* package (Rosseel, 2012). This model included adolescents' internalizing problems; the quality of their relationships with their mothers, fathers, and close friends; and adolescents' well-being. The T1 measures of all variables were allowed to covary (see Appendix A). Two paths were estimated: (1) paths between the measurement of each variable at T1 and T2 (e.g., path between internalizing problems at T1 and internalizing problems at T2), which indicate variable stability over time, and (2) cross-lagged paths (i.e., between the measurement of one variable at T1 and another variable at T2), which indicate the degree to which one variable is related to the future value of the other, after correction for the T1 score for the latter. The direct effect of the main association was given by the path between internalizing problems at T1 and well-being at T2 (Figure 1, path c). To test for indirect effects over time with two waves of data, we assumed stationarity implying that the mean, variance, and autocorrelation structure of the paths are constant over time (Little et al., 2007). Specifically, we assumed that the cross-lagged effects from 1) internalizing problems to

relationship quality and 2) from relationship quality to well-being were constant over time and, thus, that the paths from T1 to T2 are equal to hypothetical paths from T2 to T3 if we had more waves of data. We tested for indirect effects by multiplying cross-lagged effects (e.g., effects of internalizing problems at T1 on relationship quality at T2 [Figure 1, paths a1–a3] × effects of relationship quality at T1 on well-being at T2 [Figure 1, paths b1–b3]). To test for gender invariance, we performed multigroup analyses regarding the same direct paths (i.e., paths a1, a2, a3, b1, b2, b3, and c) and indirect paths in the cross-lagged panel model. To do this, an unconstrained multigroup model, in which each parameter was separately estimated for boys and girls, was compared to constrained models, in which one path at the time was fixed between boys and girls. Gender variance would be indicated by a significant increase/decrease in model fit.

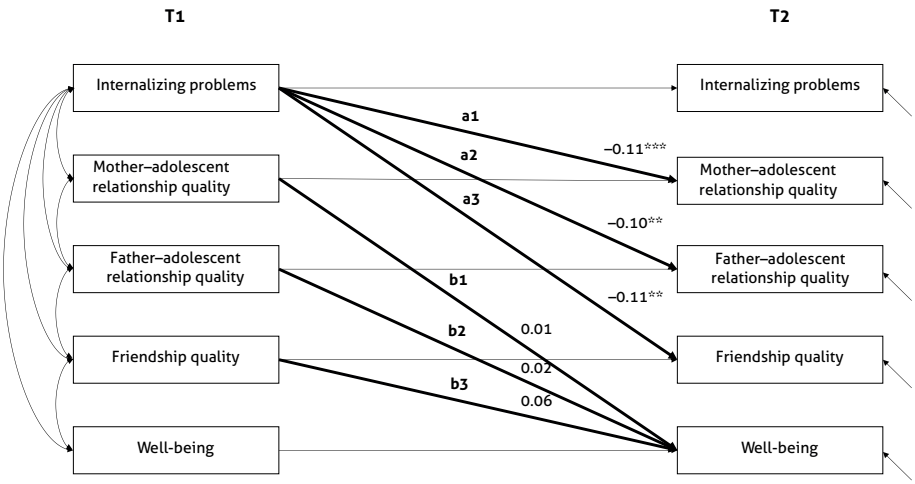

Figure 1. Two-wave cross-lagged panel model for the testing of longitudinal and indirect associations among adolescents' internalizing problems, relationship quality, and well-being
Note. For clarity, concurrent relationships between variables are not shown in the figure, but in Appendix A. All coefficients are standardized. T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019.
$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

We assessed model fit using the χ^2 statistic, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Good model fit was indicated by CFI > .90, RMSEA < .08, and SRMR ≤ .08 (Bentler & Bonnet, 1980; Hu & Bentler, 1999).

RESULTS

Gender differences and correlations

Descriptive statistics for all variables are presented in Table 1. Almost all means differed significantly between boys and girls at T1 and T2 (all $p < .05$): boys had higher well-being and higher-quality relationships with their mothers and fathers than did girls, whereas girls had more internalizing problems and higher-quality friendships than did boys. Between T1 and T2, internalizing problems increased, and well-being and the quality of all relationships decreased significantly among girls; internalizing problems increased and the quality of relationships with mothers and fathers decreased significantly among boys.

Table 1. Mean scores on internalizing problems, relationship quality with mothers, fathers, and close friends, and well-being

	Mean (*SD*)		
	Total sample	Girls	Boys
Internalizing problems T1	11.45 (9.16)	13.70 (10.00)	8.43 (6.93)
Internalizing problems T2	13.00 (10.54)	15.75 (11.11)	9.75 (8.48)
Mother–adolescent relationship quality T1	4.88 (0.75)	4.81 (0.84)	4.94 (0.73)
Mother–adolescent relationship quality T2	4.74 (0.84)	4.64 (0.91)	4.84 (0.80)
Father–adolescent relationship quality T1	4.78 (0.90)	4.66 (0.99)	4.83 (0.91)
Father–adolescent relationship quality T2	4.67 (0.92)	4.51 (1.01)	4.78 (0.90)
Friendship quality T1	4.98 (0.64)	5.03 (0.68)	4.89 (0.65)
Friendship quality T2	4.91 (0.70)	4.93 (0.71)	4.88 (0.72)
Well-being T1	3.37 (0.97)	3.26 (0.96)	3.52 (0.99)
Well-being T2	3.31 (0.98)	3.14 (0.96)	3.53 (0.95)

Independent-samples *t* tests showed that all means except friendship quality at T2 differed significantly between girls and boys ($p < .05$). Paired-samples *t* tests showed that all means differed significantly between T1 and T2 in the total sample ($p < .05$). *SD* = standard deviation; T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019.

Significant correlations were obtained between all variables (Table 2). Most correlations were weak to moderate. Correlations were found in the expected directions and showed moderate–strong consistency between T1 and T2. Specifically, adolescents' internalizing problems were negatively associated with the quality of relationships with mothers, fathers, and close friends, and with their well-being, whereas the quality of the different relationships (with mothers, fathers, and close friends) were positively associated with each other and with adolescents' well-being, both concurrently and longitudinally.

Table 2. Pearson correlations between variables of interest at T1 and T2.

	1	2	3	4	5	6	7	8	9
1. IP T1	–								
2. MRQ T1	–.39***	–							
3. FRQ T1	–.32***	.44***	–						
4. FrRQ T1	–.24***	.36***	.28***	–					
5. WB T1	–.50***	.38***	.30***	.30***	–				
6. IP T2	.69***	–.25***	–.25***	–.15***	–.36***	–			
7. MRQ T2	–.33***	.64***	.32***	.24***	.30***	–.40***	–		
8. FRQ T2	–.32***	.31***	.68***	.17***	.30***	–.40***	.45***	–	
9. FrRQ T2	–.22***	.25***	.21***	.41***	.24***	–.22***	.35***	.31***	–
10. WB T2	–.44***	.27***	.27***	.22***	.61***	–.57***	.39***	.39***	.30***

T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019; IP = internalizing problems; MRQ = mother–adolescent relationship quality; FRQ = father–adolescent relationship quality; FrRQ = friendship quality; WB = well-being. ***$p < .001$.

Indirect effects

The two-wave cross-lagged panel model including internalizing problems, well-being, and the quality of adolescents' relationships with their mother, father, and close friends showed a good fit ($\chi^2(13) = 18.12$, $p = .153$, CFI = 1.00, RMSEA = .02, SRMR = .02). All five stability paths were stable (Table 3). Regarding the direct effects of internalizing problems (hypotheses 1 and 2), internalizing problems had significant cross-lagged effects on subsequent well-being after controlling for baseline relationship quality and well-being scores, and on the subsequent quality of adolescents' relationships with their mothers, fathers, and close friends, after controlling for baseline relationship quality scores (Table 3, Figure 1).

The effect sizes of the associations between internalizing problems and the qualities of the relationships with mothers, fathers, and close friends were comparable (i.e., β's of paths a1, a2, and a3 ranged from –0.10 to –0.11), which indicates that adolescents' internalizing problems have similar linkages with their relationship qualities with mothers, fathers, as well as close friends over time. No significant cross-lagged effects were found between mother– and father–adolescent relationship quality and friendship quality and adolescents' well-being over time ($p > .05$).

There were no significant indirect effects between internalizing problems and well-being via the quality of adolescents' relationships with their mother (β = –0.00, p = .835), father (β= –0.00, p = .629), or close friends (β = –0.00, p = .103).

Table 3. Coefficients for adolescents' internalizing problems, relationship quality, and well-being from the two-wave cross-lagged panel model

Variable	B	SE	β	*p*
Stability paths				
Internalizing problems T1 → T2	0.79	0.036	0.69	<.001
MRQ T1 → T2	0.69	0.036	0.63	<.001
FRQ T1 → T2	0.68	0.030	0.68	<.001
FrRQ T1 → T2	0.45	0.040	0.42	<.001
Well-being T1 → T2	0.49	0.033	0.49	<.001
Cross-lagged paths				
Internalizing problems T1 → well-being T2 (path c)	–0.02	0.003	–0.17	<.001
Internalizing problems T1 → MRQ T2 (path a1)	–0.01	0.003	–0.11	<.001
Internalizing problems T1 → FRQ T2 (path a2)	–0.01	0.003	–0.10	.001
Internalizing problems T1 → FrRQ T2 (path a3)	–0.01	0.003	–0.11	.003
MRQ T1 → well-being T2 (path b1)	0.01	0.039	0.01	.837
FRQ T1 → well-being T2 (path b2)	0.02	0.031	0.02	.628
FrRQ T1 → well-being T2 (path b3)	0.09	0.044	0.06	.055

T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019; MRQ = mother–adolescent relationship quality; FRQ = father–adolescent relationship quality; FrRQ = friendship quality.

Gender invariance

The final aim of the current study was to test whether our findings were gender invariant. The unconstrained multigroup model (in which each parameter was separately estimated for boys and girls) showed good model fit ($\chi^2(26) = 40.66$, $p = .034$, CFI = .99, RMSEA = .03, SRMR = .03). The fixing of one path at a time revealed significant differences between boys and girls in the effects of internalizing problems ($\Delta\chi^2$ (1) = 4.36, p = .037) and friendship quality ($\Delta\chi^2$ (1) = 9.72, p = .002) on well-being. Specifically, the relationship between internalizing problems and subsequent well-being was significant only among girls ($\beta = -0.22$, $p < .001$), and the relationship between friendship quality and subsequent well-being was significant only among boys ($\beta = 0.16$, $p < .001$). Similar to the total sample, no significant indirect effects between internalizing problems and well-being were found for boys and girls separately.

DISCUSSION

Although adolescents with more internalizing problems are known to report lower well-being, knowledge about mechanisms potentially underpinning this association is limited. The purpose of the present study was to examine the longitudinal indirect associations between adolescents' internalizing problems and well-being, via the quality

of their most proximal relationships with mothers, fathers, and close friends. In sum, the results showed: (1) that girls, but not boys, with more internalizing problems reported lower well-being one year later (after controlling for baseline well-being); (2) that boys and girls with more internalizing problems reported lower-quality relationships with their mothers, fathers, and close friends one year later (after controlling for baseline relationship quality); (3) that boys, but not girls, with higher-quality friendships reported higher levels of well-being one year later (after controlling for baseline well-being); and (4) that no significant indirect effects between internalizing problems and well-being via the quality of adolescents' relationships with their mothers, fathers, and close friends were identified.

The gender differences in these results suggest the application of gender-specific analyses when studying adolescents' internalizing problems, well-being, and social relationship qualities. Using a comprehensive model including internalizing problems and the quality of adolescents' relationships with parents *and* close friends as predictors of well-being one year later, the current study revealed a significant negative association with girls' (not boys') internalizing problems and a significant positive association with boys' (not girls') friendship quality. These gender differences may be explained by the following factors. First, research suggests that girls do not just experience more internalizing problems and lower well-being than do boys (Bartels et al., 2013; Stevens et al., 2018), as our descriptive analysis indeed confirmed, but that girls are also more susceptible than boys to the deleterious effects of risk factors, such as internalizing problems, on different outcomes, such as well-being (Meadows et al., 2006). Second, girls have been found to co-ruminate (i.e., disclose and extensively discuss emotional problems in dyadic relationships) with friends and experience more empathic distress in their friendships than do boys (Smith, 2015). Thus, compared with boys, girls with internalizing problems may have more disturbed and ephemeral friendships, which may affect the strength and stability of the association between friendship quality and well-being. Third, although prior research reveals that girls' friendships typically are deeper and more interdependent than boys' friendships (for a review, see Gorrese & Ruggieri, 2012), there are also studies that revealed the importance of friendships for boys' (and not girls') well-being (Cuadros & Berger, 2016; Graber et al., 2016; Way, 2011). More research is needed to increase our understanding of these gender differences in the linkages between internalizing problems, friendship quality, and well-being.

Notwithstanding the abovementioned gender differences, the negative associations between adolescents' internalizing problems, on the one hand, and the quality of their relationships with their parents and close friends, on the other hand, were found to be gender invariant. Thus, as hypothesized, both boys and girls with more internalizing

problems reported lower-quality relationships with mothers, fathers, and close friends over time. These findings support the theoretical suggestion that internalizing problems are intertwined with adolescents' most proximal social relationships and for both genders (Boivin et al., 1995;Flynn & Rudolph, 2014; Rudolph et al., 2009; Young & Mufson, 2008). In addition, these findings resemble prior empirical research, showing that adolescents with more internalizing problems report lower-quality relationships with parents and close friends (Branje et al., 2010; Kochel et al., 2012). Future studies are needed to increase our understanding of the mechanisms underlying the links between adolescents' internalizing problems and their relationships with parents and close friends.

One unanticipated finding was the lack of a significant association between mother– or father–adolescent relationship quality and adolescents' subsequent well-being. Previous research showed that adolescents with higher-quality parent–adolescent relationships tend to have higher levels of well-being than do those with lower-quality parent–adolescent relationships (for a meta-analysis, see Chu et al., 2010). This difference may be explained by our use of a comprehensive and strict model including relationships with mothers, fathers, *and* close friends, while controlling for baseline levels of well-being at T1. Such an approach is appropriate, given the interrelationships among all of these variables (Bokhorst et al., 2010; De Goede et al., 2009; Oberle et al., 2011) and as adolescents develop through continuous interactions with these actors (Bronfenbrenner & Morris, 2006). In addition, descriptive analyses revealed that the adolescents in our sample had high well-being levels at T1; considering the longitudinal stability of well-being (Eid & Diener, 2004; Miething et al., 2016), little variance attributable to parent–adolescent relationship quality may have remained beyond the initial levels of well-being and friendship quality.

Finally, no indirect effect between the association of adolescents' internalizing problems with well-being via relationship quality was found in contrast to our expectations based on previous studies (e.g., Kamper & Ostrov, 2013; Khalil & Abed, 2014). This difference may be due to differences in study design, methodology, population, and variables of interest. Khalil and Abed's (2014) research was cross-sectional and conducted with an adult clinical population, and Kamper and Ostrov's (2013) research focused on adolescents' externalizing problems and did not involve control for previous levels of outcome variables. We, on the contrary, conducted this research with a school-based adolescent sample using a strict longitudinal design with control for baseline levels of well-being. We recommend that the same model be tested with adolescents experiencing (sub)clinical levels of internalizing problems, in whom the indirect effect of relationship quality is expected to be significant (Khalil & Abed, 2014). In future

investigations, researchers may also distinguish among emotional, psychological, and social well-being, when testing indirect effects via the quality of adolescents' relationships with their parents and close friends.

Limitations and Suggestions for Future Research

The strengths of the current study include the participation of a large, culturally diverse sample of adolescents, the use of a longitudinal design, the consideration of positive and negative aspects of social relationship quality, the inclusion of data on relationships with parents and friends in the same model, and the separate examination of mother– and father–adolescent relationships. However, the present study also has some limitations that need to be considered.

First, our findings are potentially subject to response bias, as all variables were assessed using adolescents' retrospective self-reports. For example, adolescents with more and fewer internalizing problems might have answered questions about relationship quality and well-being differently (De Los Reyes et al., 2008). Moreover, our reliance on a single type of informant (adolescents) may have provided a one-sided view on relationship quality; parents and close friends could perceive these relationships differently (Filus et al., 2019). Future research would benefit from the inclusion of multi-wave data collection from parents and close friends, in addition to adolescent self-reports, and the evaluation of discrepancies among informant types.

Second, without replication, the results of this study cannot be generalized beyond non-clinical school-based samples of Dutch adolescents. On average, Dutch adolescents are among the happiest and most satisfied with their lives globally (Stevens et al., 2018). Adolescents in the Netherlands have the highest ranked well-being, exceeding that in other Western countries such as Portugal, Hungary, and the United States, and better relationships with their mothers, fathers, and close friends than do, for instance, adolescents in France and the United States (Bradshaw et al., 2013). Findings of studies conducted with other (sub-)clinical and non-clinical adolescent samples and in other countries may differ (e.g., Khalil & Abed, 2014).

Third, the cross-lagged panel model tested in the current study assumed stationarity, i.e., the constancy of the autoregressive and cross-lagged paths in the longitudinal cross-lagged panel model to test the presence of indirect over-time effects using two-wave data. This seems reasonable given the documented stability of adolescents' internalizing problems and well-being over time (Danneel et al., 2019; Eid & Diener, 2004; Miething et al., 2016; Nelemans et al., 2014). However, as we were not able to empirically test the validity of this assumption with our data, future research is recommended to use

three or more waves of data. In addition, longitudinal studies with more than two waves of data can include bidirectional paths to further increase our understanding of the directionality of these complex interrelationships among adolescents' internalizing problems, proximal social relationships, and well-being as these associations may be reciprocal (Branje et al., 2010; Gaertner et al., 2010; Miething et al., 2016).

CONCLUSIONS

Notwithstanding these limitations, the current study has relevant implications for public health policies, in which adolescents' internalizing problems and well-being are increasingly recognized as major priorities (Parkin et al., 2019; World Health Organization, 2013). Firstly, the study findings support the importance of friendships for the well-being of adolescents, even those with internalizing problems, and after controlling for the quality of adolescents' relationships with their mothers and fathers. Currently, few prevention and intervention programs addressing adolescents' internalizing problems target friendships as a mechanism for the promotion of positive change, for instance the enhancement of well-being (Hart & Heaver, 2013). However, interventions targeting adolescents' internalizing problems that focus on interpersonal relationships, including friendships, have been found to lead to successful symptom mitigation among adolescents (Cohen et al., 2015; Young & Mufson, 2008). Such findings are in accord with the positive psychological perspective (Seligman, 2010), which proposes that the identification and promotion of adolescents' strengths and resources can enhance their well-being, even in the presence of risk factors such as internalizing problems. Consequently, we recommend that these professionals invest in parent–adolescent relationships, for instance by enhancing parents' and adolescents' emotion regulation (Cheung et al., 2020), to decrease adolescents' internalizing problems. We also recommend that mental health professionals prioritize the maintenance of existing friendships and the formation of new friendships in order to improve the well-being of adolescents with internalizing problems.

REFERENCES

Bartels, M., Cacioppo, J. T., Van Beijsterveldt, T. C., & Boomsma, D. I. (2013). Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetics*, *43*(3), 177-190. https://doi.org/10.1007/s10519-013-9589-7

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588-606. https://doi.org/10.1037/0033-2909.88.3.588

Boivin, M., Hymel, S., & Bukowski, W. M. (1995). The roles of social withdrawal, peer rejection, and victimization by peers in predicting loneliness and depressed mood in childhood. *Development and Psychopathology*, *7*(4), 765-785. https://doi.org/10.1017/S0954579400006830

Bokhorst, C. L., Sumter, S. R., & Westenberg, P. M. (2010). Social support from parents, friends, classmates, and teachers in children and adolescents aged 9 to 18 years: Who is perceived as most supportive?. *Social Development*, *19*(2), 417-426. https://doi.org/10.1111/j.1467-9507.2009.00540.x

Bor, W., Dean, A. J., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal of Psychiatry*, *48*(7), 606-616. https://doi.org/10.1177/0004867414533834

Bradshaw, J., Martorano, B., Natali, L., & De Neubourg, C. (2013). Children's subjective well-being in rich countries. *Child Indicators Research*, *6*(4), 619-635. https://doi.org/10.1007/s12187-013-9196-4

Branje, S. J., Hale, W. W., Frijns, T., & Meeus, W. H. (2010). Longitudinal associations between perceived parent–child relationship quality and depressive symptoms in adolescence. *Journal of Abnormal Child Psychology*, *38*(6), 751-763. https://doi.org/10.1007/s10802-010-9401-6

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In: W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Volume 1: Theoretical models of human development*, 6th ed. New York: Wiley, pp.793-828.

Cheung, R. Y., Chan, L. Y., & Chung, K. K. (2020). Emotion dysregulation between mothers, fathers, and adolescents: Implications for adolescents' internalizing problems. *Journal of Adolescence*, *83*, 62-71. https://doi.org/10.1016/j.adolescence.2020.07.001

Chu, P. S., Saucier, D. A., & Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *Journal of Social and Clinical Psychology*, *29*(6), 624-645. https://doi.org/10.1521/jscp.2010.29.6.624

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* 2nd ed. Hillsdale, NJ: Erlbaum.

Cohen, J.R., Spiro, C.N., Young, J.F., Gibb, B. E., Hankin, B. L., & Abela, J. R. Z. (2015). Interpersonal Risk Profiles for Youth Depression: A Person-Centered, Multi-Wave, Longitudinal Study. *Journal of Abnormal Child Psychology*, *43*, 1415-1426. https://doi.org/10.1007/s10802-015-0023-x

Costello, E. J., Copeland, W., & Angold, A. (2011). Trends in psychopathology across the adolescent years: what changes when children become adolescents, and when adolescents become adults?. *Journal of Child Psychology and Psychiatry*, *52*(10), 1015-1025. https://doi.org/10.1111/j.1469-7610.2011.02446.x

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, *48*(1), 243-267. https://doi.org/10.1146/annurev.psych.48.1.243

Cuadros, O., & Berger, C. (2016). The Protective Role of Friendship Quality on the Wellbeing of Adolescents Victimized by Peers. *Journal of Youth and Adolescence*, *45*, 1877-1888. https://doi.org/10.1007/s10964-016-0504-4

Danneel, S., Nelemans, S., Spithoven, A., Bastin, M., Bijttebier, P., Colpin, H., ... & Goossens, L. (2019). Internalizing problems in adolescence: Linking loneliness, social anxiety symptoms, and depressive symptoms over time. *Journal of Abnormal Child Psychology*, *47*(10), 1691-1705. https://doi.org/10.1007/s10802-019-00539-0

De Goede, I. H., Branje, S. J., & Meeus, W. H. (2009). Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth and Adolescence*, *38*(1), 75-88. https://doi.org/10.1007/s10964-008-9286-7

De Goede, I. H., Branje, S. J., Delsing, M. J., & Meeus, W. H. (2009). Linkages over time between adolescents' relationships with parents and friends. *Journal of Youth and Adolescence*, *38*(10), 1304-1315. https://doi.org/10.1007/s10964-009-9403-2

De Los Reyes, A., Goodman, K. L., Kliewer, W., & Reid-Quinones, K. (2008). Whose depression relates to discrepancies? Testing relations between informant characteristics and informant discrepancies from both informants' perspectives. *Psychological Assessment*, *20*(2), 139-149. https://doi.org/10.1037/1040-3590.20.2.139

Diener, E. (2009). Subjective well-being. In: E. Diener (Ed.), *The science of well-being* (pp. 11-58). Social Indicators Research Series, vol 37. Dordrecht: Springer.

Dinizulu, S. M., Grant, K. E., Bryant, F. B., Boustani, M. M., Tyler, D., & McIntosh, J. M. (2014). Parent–Adolescent Relationship Quality and Nondisclosure as Mediators of the Association Between Exposure to Community Violence and Psychological Distress. *Child Youth Care Forum*, *43*, 41-61. https://doi.org/10.1007/s10566-013-9224-z

Ebesutani, C., Reise, S. P., Chorpita, B. F., Ale, C., Regan, J., Young, J., ... & Weisz, J. R. (2012). The Revised Child Anxiety and Depression Scale-Short Version: Scale reduction via exploratory bifactor modeling of the broad anxiety factor. *Psychological Assessment*, *24*(4), 833-845. https://doi.org/10.1037/a0027283

Eid, M., & Diener, E. (2004). Global judgments of subjective well-being: Situational variability and long-term stability. *Social Indicators Research*, *65*, 245–277. https://doi.org/10.1023/B:SOCI.0000003801.89195.bc

Enders, C. K., & Bandalos, D. L. (2001) The Relative Performance of Full Information Maximum Likelihood Estimation for Missing Data in Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal*, *8*(3), 430-457. https://doi.org/10.1207/S15328007SEM0803_5

Filus, A., Schwarz, B., Mylonas, K., Sam, D. L., & Boski, P. (2019). Parenting and late Adolescents' well-being in Greece, Norway, Poland and Switzerland: associations with individuation from parents. *Journal of Child and Family Studies*, *28*(2), 560-576. https://doi.org/10.1007/s10826-018-1283-1

Finkenauer, C., & Righetti, F. (2011). Understanding in close relationships: An interpersonal approach. *European Review of Social Psychology*, *22*(1), 316-363. https://doi.org/10.1080/10463283.2011.633384

Flynn, M., & Rudolph, K. D. (2014). A prospective examination of emotional clarity, stress responses, and depressive symptoms during early adolescence. *The Journal of Early Adolescence*, *34*(7), 923-939. https://doi.org/10.1177/0272431613513959

Furman, W., & Buhrmester, D. (2009). Methods and measures: The network of relationships inventory: Behavioral systems version. *International Journal of Behavioral Development, 33*(5), 470-478. https://doi.org/10.1177/0165025409342634

Gaertner, A. E., Fite, P. J., & Colder, C. R. (2010). Parenting and friendship quality as predictors of internalizing and externalizing symptoms in early adolescence. *Journal of Child and Family Studies, 19*(1), 101-108. https://doi.org/10.1007/s10826-009-9289-3

Gorrese, A., & Ruggieri, R. (2012). Peer attachment: A meta-analytic review of gender and age differences and associations with parent attachment. *Journal of Youth and Adolescence, 41*(5), 650-672. https://doi.org/10.1007/s10964-012-9759-6

Hart, A., & Heaver, B. (2013). Evaluating resilience-based programs for schools using a systematic consultative review. *Journal of Child and Youth Development*, 1(1), 27-53. Available at: https://core.ac.uk/reader/188252090 [Accessed 25 Jan. 2021].

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Kamper, K. E., & Ostrov, J. M. (2013). Relational aggression in middle childhood predicting adolescent social-psychological adjustment: The role of friendship quality. *Journal of Clinical Child & Adolescent Psychology, 42*(6), 855-862. https://doi.org/10.1080/15374416.2013.844595

Keizer, R., Helmerhorst, K. O., & Van Rijn-van Gelderen, L. (2019). Perceived quality of the mother–adolescent and father–adolescent attachment relationship and adolescents' self-esteem. *Journal of Youth and Adolescence, 48*(6), 1203-1217. https://doi.org/10.1007/s10964-019-01007-0

Kesebir, P., & Diener, E. (2009). In pursuit of happiness: Empirical answers to philosophical questions. In E. Diener (Eds.), *The science of well-being.* Dordrecht: Springer, 59-74.

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology, 73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Khalil, A. A., & Abed, M. A. (2014). Perceived social support is a partial mediator of the relationship between depressive symptoms and quality of life in patients receiving hemodialysis. *Archives of Psychiatric Nursing, 28*(2), 114-118. https://doi.org/10.1016/j.apnu.2013.11.007

Kochel, K. P., Ladd, G. W., & Rudolph, K. D. (2012). Longitudinal associations among youth Depressive symptoms, peer victimization, and low peer acceptance: An interpersonal process perspective. *Child Development, 83*(2), 637-650. https://doi.org/10.1111/j.1467-8624.2011.01722.x

Lewis, C., & Lamb, M. E. (2003). Fathers' influences on children's development: The evidence from two-parent families. *European Journal of Psychology of Education, 18*(2), 211-228. https://doi.org/10.1007/BF03173485

Little, T. D., Preacher, K. J., Selig, J. P., & Card, N. A. (2007). New developments in latent variable panel analyses of longitudinal data. *International Journal of Behavioral Development, 31*(4), 357-365. https://doi.org/10.1177/0165025407077757

Long, E., Gardani, M., McCann, M., Sweeting, H., Tranmer, M., & Moore, L. (2020). Mental health disorders and adolescent peer relationships. *Social Science & Medicine, 253*, Article 112973. https://doi.org/10.1016/j.socscimed.2020.112973

Luijten, C. C., Kuppens, S., Van de Bongardt, D., & Nieboer, A. P. (2019). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Dutch adolescents. *Health and Quality of Life Outcomes, 17*(1), 157. https://doi.org/10.1186/s12955-019-1221-y

Lyons, M. D., Huebner, E. S., Hills, K. J., & Van Horn, M. L. (2013). Mechanisms of change in adolescent life satisfaction: A longitudinal analysis. *Journal of School Psychology*, *51*(5), 587-598. https://doi.org/10.1016/j.jsp.2013.07.001

Meadows, S.O., Brown, J.S. & Elder, G.H. (2006). Depressive Symptoms, Stress, and Support: Gendered Trajectories From Adolescence to Young Adulthood.*Journal of Youth and Adolescence*,*35*(1), 93-103. https://doi.org/10.1007/s10964-005-9021-6

Miething, A., Almquist, Y. B., Östberg, V., Rostila, M., Edling, C., & Rydgren, J. (2016). Friendship networks and psychological well-being from late adolescence to young adulthood: a gender-specific structural equation modeling approach. *BMC Psychology*, *4*(1), Article 34. https://doi.org/10.1186/s40359-016-0143-2

Nelemans, S. A., Hale, W. W., Branje, S. J., Hawk, S. T., & Meeus, W. H. (2014). Maternal criticism and adolescent depressive and generalized anxiety disorder symptoms: A 6-year longitudinal community study. *Journal of Abnormal Child Psychology*, *42*(5), 755-766. https://doi.org/10.1007/s10802-013-9817-x

Nieboer, A., & Lindenberg, S. (2002) Substitution, Buffers and Subjective Well-Being: A Hierarchical Approach. In: E. Gullone, R. A. Cummins (Eds.), *The Universality of Subjective Wellbeing Indicators*. Social Indicators Research Series, vol 16. Dordrecht: Springer, pp. 175-189.

Nogueira Avelar E Silva, R., Van de Bongardt, D., Van de Looij-Jansen, P., Wijtzes, A., & Raat, H. (2016). Mother–and father–adolescent relationships and early sexual intercourse.*Pediatrics*,*138*(6), e20160782. https://doi.org/10.1542/peds.2016-0782

Oberle, E., Schonert-Reichl, K. A., & Zumbo, B. D. (2011). Life satisfaction in early adolescence: personal, neighborhood, school, family, and peer influences. *Journal of Youth and Adolescence*, *40*, 889–901. https://doi.org/10.1007/s10964-010-9599-1

Parkin, E., Long, R., & Gheera, M. (2019). *Children and young people's mental health: policy, services, funding and education* (No. 07196). Available at: https://dera.ioe.ac.uk/30819/1/CBP-7196%20_Redacted.pdf

Raboteg-Šarić, Z., & Šakić, M. (2014). Relations of parenting styles and friendship quality to self-esteem, life satisfaction and happiness in adolescents. *Applied Research in Quality of Life*,*9*(3), 749-765. https://doi.org/10.1007/s11482-013-9268-0

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software*, *48*, 1-36. Available at: https://users.ugent.be/~yrosseel/lavaan/lavaanIntroduction.pdf

Rudolph, K. D., Flynn, M., Abaied, J. L., Groot, A., & Thompson, R. (2009). Why is past depression the best predictor of future depression? Stress generation as a mechanism of depression continuity in girls.*Journal of Clinical Child & Adolescent Psychology*,*38*(4), 473-485. https://doi.org/10.1080/15374410902976296

Sass, D. A., Schmitt, T. A., & Marsh, H. W. (2014). Evaluating model fit with ordered categorical data within a measurement invariance framework: A comparison of estimators. *Structural Equation Modeling: A Multidisciplinary Journal*, *21*(2), 167-180. https://doi.org/10.1080/10705511.2014.882658

Schwartz-Mette, R. A., Shankman, J., Dueweke, A. R., Borowski, S., & Rose, A. J. (2020). Relations of friendship experiences with depressive symptoms and loneliness in childhood and adolescence: A meta-analytic review. *Psychological Bulletin*, *146*(8), 664-700. https://doi.org/10.1037/bul0000239

Seligman, M. (2010). Flourish: Positive psychology and positive interventions. *The Tanner Lectures on Human Values*, *31*(4), 1-56. Available at: https://tannerlectures.utah.edu/_documents/a-to-z/s/Seligman_10.pdf [Accessed at 23 Jan. 2021].

Smetana, J. G., Campione-Barr, N., & Metzger, A. (2006). Adolescent development in interpersonal and societal contexts. *Annual Review of Psychology*, *57*, 255-284. https://doi.org/10.1146/annurev.psych.57.102904.190124

Smith, R. L. (2015). Adolescents' emotional engagement in friends' problems and joys: Associations of empathetic distress and empathetic joy with friendship quality, depression, and anxiety. *Journal of Adolescence*, *45*, 103-111. https://doi.org/10.1016/j.adolescence.2015.08.020

Stevens, G. W. J. M., Van Dorsselaer, S., Boer, M., de Roos, S., Duinhof, E. L., ter Bogt, T. F. M., ... & de Looze, M. (2018). *HBSC 2017. Gezondheid en welzijn van jongeren in Nederland*. Available at: https://hbsc-nederland.nl/wp-content/uploads/2018/09/Rapport-HBSC-2017.pdf [Accessed at 15 May 2020].

Van de Bongardt, D., Reitz, E., & Deković, M. (2016). Indirect over-time relations between parenting and adolescents' sexual behaviors and emotions through global self-esteem. *The Journal of Sex Research*, *53*(3), 273-285. https://doi.org/10.1080/00224499.2015.1046155

Van Eijck, F. E., Branje, S. J., Hale, W. W., & Meeus, W. H. (2012). Longitudinal associations between perceived parent–adolescent attachment relationship quality and generalized anxiety disorder symptoms in adolescence. *Journal of Abnormal Child Psychology*, *40*(6), 871-883. https://doi.org/10.1007/s10802-012-9613-z

Verbeek, M., Van De Bongardt, D., Reitz, E., & Deković, M. (2020). A Warm Nest or 'The Talk'? Exploring and Explaining Relations Between General and Sexuality-Specific Parenting and Adolescent Sexual Emotions. *Journal of Adolescent Health*, *66*(2), 210-216. https://doi.org/10.1016/j.jadohealth.2019.08.015

Way, N. (2011). *Deep secrets: Boys' friendships and the crisis of connection*. Cambridge, MA: Harvard University Press.

Way, N. (2013). Boys' friendships during adolescence: Intimacy, desire, and loss. *Journal of Research on Adolescence*, *23*(2), 201-213. https://doi.org/10.1111/jora.12047

World Health Organization. (2013). *Mental health action plan 2013-2020*. Available at: https://apps.who.int/iris/bitstream/handle/10665/89966/9789241506021_eng.pdf [Accessed at 1 Jun. 2020].

Young, J. F. & Mufson, L. (2008). Interpersonal psychotherapy for treatment and prevention of adolescent depression. In: J. R. Z. Abela, B. L. Hankin (Eds.), *Handbook of depression in children and adolescents*. New York: The Guilford Press, pp. 288-306.

Yuan, K. H. & Bentler, P. M. (2000). 5. Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology*, *30*, 165-200. https://doi.org/10.1111/0081-1750.00078

APPENDIX A

Concurrent covariances of adolescents' internalizing problems, relationship quality, and well-being in the two-wave cross-lagged panel model.

Variables	B	SE	β	*p*
Internalizing problems T1 – well-being T1	–4.45	0.337	–0.50	<.001
Internalizing problems T1 – MRQ T1	–2.84	0.289	–0.39	<.001
Internalizing problems T1 – FRQ T1	–3.00	0.293	–0.34	<.001
Internalizing problems T1 – FrRQ T1	–1.45	0.232	–0.24	<.001
MRQ T1 – FRQ T1	0.35	0.030	0.44	<.001
MRQ T1 – FrRQ T1	0.19	0.019	0.36	<.001
MRQ T1 – well-being T1	0.30	0.028	0.38	<.001
FRQ T1 – FrRQ T1	0.19	0.022	0.29	<.001
FRQ T1 – well-being T1	0.30	0.030	0.31	<.001
FrRQ T1 – well-being T1	0.20	0.023	0.31	<.001
Internalizing problems T2 – well-being T2	–2.63	0.386	–0.46	<.001
Internalizing problems T2 – MRQ T2	–1.42	0.246	–0.29	<.001
Internalizing problems T2 – FRQ T2	–1.48	0.251	–0.29	<.001
Internalizing problems T2 – FrRQ T2	–0.62	0.227	–0.13	.007
MRQ T2 – FRQ T2	0.18	0.022	0.41	<.001
MRQ T2 – FrRQ T2	0.12	0.018	0.28	<.001
MRQ T2 – well-being T2	0.13	0.022	0.27	<.001
FRQ T2 – FrRQ T2	0.12	0.018	0.27	<.001
FRQ T2 – well-being T2	0.15	0.023	0.29	<.001
FrRQ T2 – well-being T2	0.09	0.020	0.19	<.001

T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019; MRQ = mother–adolescent relationship quality; FRQ = father–adolescent relationship quality, FrRQ = friendship quality.

5

The roles of social media use and friendship quality in adolescents' internalizing problems and well-being

This paper was published as:
Luijten, C. C., Van de Bongardt, D., & Nieboer, A. P. (2022). The roles of social media use and friendship quality in adolescents' internalizing problems and well-being. Journal of Happiness Studies, 23, 3161-3178. https://doi.org/10.1007/s10902-022-00539-w

ABSTRACT

Background

Adolescents spend increasing amounts of time using social media, but whether social media use has a beneficial or harmful role in internalizing problems and well-being during adolescence remains under debate. The present study explored associations of social media use and friendship quality with adolescents' internalizing problems and well-being both concurrently and longitudinally, including the exploration of interactive effects between social media use and friendship quality and the examination of gender differences.

Methods

Online questionnaire data collected in Spring 2018 and Spring 2019 from 1,298 Dutch adolescents aged 11¬17 years (mean age 13.7 ± 1.1 years, 53.2% girls) were used.

Results

Path analyses showed that, cross-sectionally, girls (not boys) who used social media more frequently had more internalizing problems and lower well-being. Boys and girls with higher-quality friendships reported fewer concurrent internalizing problems and higher concurrent and longitudinal well-being; the association with internalizing problems was significantly stronger for girls as for boys. We found no significant interaction between social media use and friendship quality.

Conclusions

Thus, the present study indicates that social media use and friendship quality have unique roles in adolescents' internalizing problems and well-being. Furthermore, the findings support the importance of gender-specific approaches to decrease adolescents' internalizing problems and enhance their well-being.

INTRODUCTION

Since the early 2000s, adolescents have spent increasing amounts of time engaging with social media (Boyd & Ellison, 2007), defined broadly as media used for social interaction, or digital applications or tools that allow users to generate and share content and communicate with others (Carr & Hayes, 2015; Moreno & Kota, 2013). Today, most adolescents use social media (e.g., WhatsApp, Facebook, Instagram, and Snapchat); for instance, about 95% of Dutch adolescents (aged 12–18 years) report such use (Centraal Bureau voor Statistiek, 2019) and, although use frequency varies widely among individuals, 31% use social media almost all the time throughout the day (Stevens et al., 2018). Thus, an increased understanding of the role of social media use in adolescents' development, and specifically their mental health, is needed, as this factor is an important societal concern in research, practice, and public health policy (e.g., Clarke et al., 2015; Parkin et al., 2019).

In conceptualizing mental health, increasing attention is being paid to the integration of symptoms with strengths and the balance between risks and resources (Kobau et al., 2011; Peterson & Seligman, 2004). The dual-continuum model holds that mental health problems (e.g., internalizing problems, including depressive and anxiety symptoms) and well-being (i.e., life satisfaction, positive emotions, and good functioning in one's individual endeavors and social life; Diener, 2009; Gallagher et al., 2009) are related, yet distinct, continua, rather than opposite ends of a single continuum (Keyes, 2005). Concerns have been raised about the potential role of social media use in adolescents' internalizing problems and well-being, and recent research has indicated the relevance of distinguishing the two (Boer et al., 2020; Fardouly et al., 2018; Petropoulos Petalas et al., 2021).

As social media use is inherently social, and intertwined with the ways in which adolescents establish and maintain (offline) friendships, the consideration of friendships is important when examining the role of social media use in adolescents' internalizing problems and well-being (Koo et al., 2015). Adolescents with higher-quality friendships report fewer internalizing problems (Schwartz-Mette et al., 2020) and higher well-being (Raboteg-Šarić & Šakić, 2014) than do those with lower-quality friendships. Moreover, the associations of social media use with adolescents' internalizing problems and well-being may depend on adolescents' friendships. Particularly friendship quality, characterized by positive (e.g., warmth) and negative (e.g., conflict) aspects (Furman & Buhrmester, 2009), has been found to affect (moderate) associations among adolescents' social media use, internalizing problems, and well-being (Selfhout et al., 2009; Valkenburg & Peter, 2007).

Within the social media literature, four theoretical hypotheses are discussed regarding the interactive effects of social media use and friendship quality. The *rich-get-richer hypothesis* suggests that more-frequent social media use has the most-beneficial effects for adolescents with higher-quality friendships, as these media are ideal for the maintenance of these friendships and facilitate social network expansion for these adolescents, who may have better social skills that can be used to connect with new friends online (Kraut et al., 2002). The *poor-get-poorer* hypothesis suggests that more-frequent social media use has more-detrimental effects for adolescents with lower-quality friendships, who may have poorer social skills and be more likely to use social media to escape from real-life problems, which could have negative outcomes (Selfhout et al., 2009). The *social compensation* or *poor-get-richer* hypothesis suggests that adolescents with lower-quality friendships benefit from more-frequent social media use because fewer constraints that lead them to interact poorly in real-life face-to-face encounters with their friends are present in the online environment (Valkenburg & Peter, 2007). The *rich-get-poorer* hypothesis suggests that more-frequent social media use is harmful for adolescents with higher-quality friendships because it may reduce opportunities to maintain (offline) friendships or because these adolescents have less to gain from such use than do adolescents with lower-quality friendships (Lin et al., 2018).

In the present study, we first aimed to increase our understanding of the simultaneous associations of friendship quality and social media use with adolescents' internalizing problems and well-being, both concurrently and longitudinally. In support of prior research, we hypothesized that higher-quality friendships would be related to fewer internalizing problems and greater well-being among adolescents (Raboteg-Šarić & Šakić, 2014; Schwartz-Mette et al., 2020). Despite the increasing body of research on associations of social media use with adolescents' internalizing problems and well-being, systematic reviews reveal little agreement on whether effects of social media use on these factors are beneficial or harmful (e.g., Seabrook et al., 2016) and associations found are often small (e.g., Orben & Przybylski, 2019). Therefore, we expected that the role of social media use could be either negative (i.e., resulting in more internalizing problems and lower well-being) or positive (i.e., resulting in fewer internalizing problems and higher well-being).

In addition, we aimed to examine interactive effects of social media use and friendship quality based on the abovementioned theoretical hypotheses from the literature on social media use. Empirical results of the examination of these hypotheses, especially of the rich-get-richer versus social compensation hypothesis, are mixed, and the identified interaction effects between social media use and friendship quality have been weak.

For instance, a longitudinal study showed that social media use (measured as Twitter activity) was associated with fewer internalizing problems among adolescents with lower than among those with higher perceived friendship quality (Cole et al., 2019), thus supporting the social compensation hypothesis. Cross-sectional research has provided support for the rich-get-richer hypothesis, showing that the benefits of social media use are greater for adolescents who have good offline friendships than among those who do not (Khan et al., 2016). The present study contributed to the existing body of literature by exploring the applicability of all four hypotheses in characterizing the interaction between social media use and friendship quality in one study, while investigating concurrent and longitudinal associations with adolescents' internalizing problems and well-being.

Furthermore, the impacts of social media use (Ivie et al., 2020; Orben, 2020; Sarmiento et al., 2018; Schønning et al., 2020) and friendship quality (Raboteg-Šarić & Šakić, 2014; Schwartz-Mette et al., 2020) on adolescents' internalizing problems and well-being may differ by gender. Girls are typically socialized to value social relationships more than boys (You et al., 2018) and they appear to be more sensitive to social influences than boys (Cialdini & Trost, 1998; Rudolph & Conley, 2005). For instance, friendship quality has been found to be more important for the psychological well-being of girls compared to that of boys (Almquist et al., 2014). Girls are also argued to be more prone than boys to experience adverse effects of more-frequent social media use on their internalizing problems and well-being (Nesi & Prinstein, 2015). However, recent reviews of adolescents' social media use show that such gender differences are understudied. As girls report more social media use, greater friendship quality, more internalizing problems, and lower well-being than do boys (Bartels et al., 2013; Kelly et al., 2018; Raboteg-Šarić & Šakić, 2014; Stevens et al., 2018), we hypothesized that associations of social media use and friendship quality with adolescents' internalizing problems and well-being would be stronger for girls than for boys.

METHODS

Participants

The present study was part of a larger two-wave longitudinal project on the socioecological predictors of the well-being of adolescents in the Netherlands (Luijten et al., 2019; 2021a; 2021b). With the schools' provision of informed consent, adolescents from three secondary schools located in the areas of two large cities in the Netherlands (Amsterdam and Rotterdam) participated in the two study waves in spring 2018 (T1; grades 7–9) and spring 2019 (T2; grades 7–10). In each wave, adolescents

and their parents were sent emails describing the study objectives and procedure, with an invitation to participate. The adolescents and their parents could decline study participation; 6.2% (*n* = 84) and 1.0% (*n* = 13), respectively, did so at T1, and 0% and 0.8% (*n* = 11), respectively, did so at T2. The medical ethics committee of Erasmus Medical Centre (Rotterdam) determined that the Medical Research Involving Human Subjects Act was not applicable to this study (protocol no. MEC-2018-055).

Overall, 1,304 adolescents (53.0% girls, mean age 13.8 ± 1.1 years) participated in the study (T1: *n* = 1,124, 53.1% girls, mean age 13.7 ± 1.1 years; T2: *n* = 1,055, 55.4% girls, mean age 14.6 ± 1.1 years). Most (*n* = 875, 82.9%) T2 participants had participated at T1. The sample analyzed in the present study comprised 1,298 adolescents (53.2% girls, mean age 13.7 ± 1.1 years), as 6 participants were excluded due to missing data on the study variables of interest. About three-quarters of the participants were enrolled in higher senior general/pre-university (73.3%) education and about one quarter were enrolled in lower pre-vocational (26.7%) education. Based on birthplace information for the students and their parents, 57.0% of the participants had Western (Europe, the United States, Canada, Australia, and New Zealand) ethnocultural backgrounds and 43.0% had non-Western (Africa, the Middle East, Asia, and Latin and South America) backgrounds. Most of the participants were living with both parents (72.9%), followed by those living with one parent (15.0%), those having separated parents with co-parenting (6.7%), and those living in other situations (i.e., with one parent and his or her new partner [4.2%], with foster parents [1.0%], or on their own [0.1%]).

Procedure

For both study waves, the lead researcher (the first author) and trained research assistants visited the participants' classes, introducing the study, answering questions, and asking them to fill out online questionnaires. The researchers were present during questionnaire administration and ensured the students' privacy and data confidentiality. After filling out the questionnaire, the participants received small, non-financial rewards (e.g., candy), the lead researcher's contact information in case of questions, and a list of websites providing information on the questionnaire topics. They were also entered into raffles for one gift (e.g., iPhone, PlayStation) per school and one gift card (€5–10, depending on grade) per class.

Measures

Well-being

The 14-item Mental Health Continuum-Short Form (MHC-SF; Keyes, 2005) was used to assess adolescents' emotional (three items), psychological (six items), and social (five items) well-being. Respondents were asked to report the frequency with which they had

felt corresponding well-being aspects (e.g., happiness, responsibility management, and contributions to society) in the past month using a six-point scale ranging from 0 (never) to 5 (every day). Mean scores were calculated, with higher scores indicating higher levels of well-being. The MHC-SF has been validated for use with Dutch adolescents (Luijten et al., 2019) and showed good reliability in the current study (Cronbach's α = 0.91 at T1, 0.92 at T2).

Internalizing problems

The Revised Child Anxiety and Depression Scale-25 (RCADS-25; Ebesutani et al., 2012) was used to assess the participants' internalizing problems, based on anxiety (15 items; e.g., "I worry about things") and depression (10 items; e.g., "Nothing is much fun anymore") symptoms on a four-point scale ranging from 0 (never) to 3 (always). The reliability and validity of the two subscales have been confirmed, and total (summed) RCADS-25 scores have been shown to reliably reflect internalizing problems (Ebesutani et al., 2012). Higher total scores indicate greater symptom frequency. The RCADS-25 showed good reliability in the current study (Cronbach's α = 0.91 at T1, 0.92 at T2).

Social media use

Social media use was measured with an item that is often used in scientific studies to measure general social media use: "How much time do you spend on social networking sites or apps like WhatsApp, Facebook, Instagram, and Snapchat?" (e.g., Bevelander et al., 2018; Marino et al., 2016, 2020). Responses were structured by a five-point scale (1 = never, 5 = always).

Friendship quality

The three-item satisfaction (e.g., "How satisfied are you with the relationship with your close friends?") and conflict (e.g., "How much do you and your close friends argue with each other?") subscales of the Network of Relationships Inventory (Furman & Buhrmester, 2009) were used to assess the overall quality of adolescents' close friendships. These subscales have often been applied to the examination of parental (e.g., Van de Bongardt et al., 2016; Zhang et al., 2018) and peer (e.g., Zhang et al., 2018) relationship quality. Item responses are structured by a six-point scale ranging from 1 (none) to 6 (the most). Conflict item scores were inverted so that higher mean scores reflected greater relationship quality (e.g., Zhang et al., 2018). In the current study, this six-item inventory showed good reliability (Cronbach's α = 0.82 at T1, 0.81 at T2).

Statistical analyses

Using SPSS (version 27; IBM Corporation, Armonk, NY, USA), descriptive statistics were calculated for all variables. Mean T1 and T2 RCADS-25 and MHC-SF scores were

compared using the paired-samples *t* test, and all mean scores were compared between boys and girls using the independent-samples *t* test. Bivariate Pearson correlations between the study variables were examined, with *r* values of 0.10–0.29, 0.30–0.49, and ≥0.50 considered to reflect weak, moderate, and strong correlation, respectively (Cohen, 1988). For all analyses, the alpha level was set to 5.0%.

The study hypotheses were tested with path models using structural equation modeling in R (version 4.0.3; R Core Team) with the *lavaan* package (Rosseel, 2012). To handle missing data (i.e., 13.9–19.1% of all total scores, attributable primarily to participant absences), the full information maximum likelihood (FIML) method (Enders & Bandalos, 2001) was used. This method allows for the use of all available data and provides more accurate results than listwise deletion (e.g., Enders & Bandalos, 2001). To account for non-normal data distributions, robust maximum likelihood estimation was performed with the calculation of robust standard errors and adjusted chi-squared values (Sass et al., 2014; Yuan & Bentler, 2000). We assessed model fit using the χ^2 statistic, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Good model fit was indicated by CFI > .90, RMSEA < .08, and SRMR ≤ .08 (Bentler & Bonnet, 1980; Hu & Bentler, 1999).

We tested cross-sectional (T1) and longitudinal (T1–T2) models of associations with adolescents' internalizing problems (model A) and well-being (model B). All potential predictors were measured at T1. Initial levels of internalizing problems and well-being were included as covariates in the longitudinal models. Because of the documented relevance of gender, age, ethnocultural background, and education level to the concepts investigated (Kriesi et al., 2012; Orben, 2020; Salmela-Aro & Tynkkynen, 2010; Vacek et al., 2010; Yucel & Yuan, 2016), these sociodemographic variables were included as covariates in all models. Concurrent correlations between the covariates and the predictors were allowed, except for the correlation between covariates age and ethnocultural background.

We tested two forms of models A and B: model 1 was used to examine the main effects of social media use and friendship quality, and model 2 additionally included the interaction term of social media use × friendship quality. With both models, we also tested two-way interactions of gender with social media use and friendship quality (i.e., gender × social media use and gender × friendship quality). The three-way interaction term of gender × social media use × friendship quality was also added to model 2. All continuous independent variables were centered to minimize multicollinearity. For significant interaction terms, we conducted stratified follow-up analyses to gain further insight.

RESULTS

Sample characteristics

Most adolescents in the sample used social media; according to self-reports, 1.4% of adolescents never, 7.8% almost never, 27.8% sometimes, 53.6% often, and 9.3% always used social media at T1. On average, the adolescents in our sample scored 3.6 on this 5-point scale, suggesting an average use of social networking sites or social medial apps between 'sometimes' and 'often', leaning slightly more toward 'often'. Girls reported more frequent social media use, higher friendship quality, and more internalizing problems than did boys, whereas boys reported higher well-being than did girls (Table 1). Between T1 and T2, boys' and girls' internalizing problems increased significantly (both $p < .05$) and girls' (but not boys') well-being decreased significantly ($t[483] = 2.74$, $p = .006$; Table 1).

Table 1. Mean social media use, friendship quality, well-being, and internalizing problems scores

	Mean (*SD*)		
	Total sample	Girls	Boys
Social media use T1	3.62 (0.82)	3.80[a] (0.72)	3.40 (0.87)
Friendship quality T1	4.97 (0.67)	5.03[a] (0.68)	4.89 (0.65)
Internalizing problems T1	11.45 (9.16)	13.70[a] (10.00)	8.43 (6.93)
Internalizing problems T2	13.00 (10.54)	15.75[a] (11.11)	9.76 (8.48)
Well-being T1	3.37 (0.97)	3.26 (0.96)	3.52[b] (0.99)
Well-being T2	3.31 (0.98)	3.14 (0.96)	3.53[b] (0.95)

Note. Independent-samples *t* tests showed that all means at T1 and T2 differed significantly between girls and boys ($p < .001$). Paired-samples *t* tests showed that internalizing problems increased significantly ($t[871] = -5.86$, $p < .001$) and well-being decreased significantly ($t[869] = 1.97$, $p = .049$) between T1 and T2 in the total sample. *SD*, standard deviation; T1, spring 2018; T2, spring 2019. [a]Larger mean scores for girls, [b]larger mean scores for boys.

Significant correlations among social media use, friendship quality, and internalizing problems were found at T1 and T2 (Table 2). Correlations with social media use were positive, whereas those between friendship quality and internalizing problems were negative. At T1 and T2, friendship quality, but not social media use, correlated positively with well-being (Table 2). Most correlations were weak to moderate.

Model A: internalizing problems

The cross-sectional version of Model A fitted the data well ($\chi^2(1) = 3.73$, $p = .053$, CFI = 0.99, RMSEA = 0.05, SRMR = 0.01). Cross-sectionally, social media use, friendship quality, and gender were related significantly to the participants' internalizing problems, whereas covariates age, ethnocultural background, and educational level were not (Table 3). More internalizing problems were reported by girls, more-frequent social media users,

Table 2. Pearson correlations between variables of interest at T1 and T2

	1	2	3	4	5
1. Social media use T1	–				
2. Friendship quality T1	.11***	–			
3. Internalizing problems T1	.12***	–.24***	–		
4. Well-being T1	–.03	.30***	–.50***	–	
5. Internalizing problems T2	.09**	–.15***	.69***	–.36 ***	–
6. Well-being T2	–.00	.22***	–.44***	.61***	–.57***

Note. $^{**}p < .01$, $^{***}p < .001$. T1, spring 2018; T2, spring 2019.

and adolescents with lower-quality friendships. The association with friendship quality was significantly stronger than that with social media use ($p < .001$), and the interaction between these variables was not significant (B = –0.06, SE = 0.43, β = –0.00, $p = .895$). Accordingly, model fit did not change after adding the interaction effect.

The longitudinal version of Model A also showed good model fit ($\chi^2(1) = 3.71$, $p = .054$, CFI = 1.00, RMSEA = 0.05, SRMR = 0.01). Age, gender, and internalizing problems at T1 were significant covariates in the longitudinal model; ethnocultural background and education level were not (Table 3). Girls, younger adolescents, and adolescents with more internalizing problems at T1 reported more internalizing problems at T2 than did boys, older adolescents, and those with fewer internalizing problems at T1, respectively. Although social media use and friendship quality were associated significantly with adolescents' internalizing problems concurrently, they were not related significantly to adolescents' internalizing problems one year later. After adding the interaction between social media use and friendship quality model fit did not change and the interaction effect was not significant (B = 0.20, SE = 0.54, β = 0.01, $p = .718$).

Model B: well-being

The cross-sectional version of Model B fitted the data well ($\chi^2(1) = 3.71$, $p = .054$, CFI = 0.99, RMSEA = 0.05, SRMR = 0.01). In the cross-sectional model, gender and friendship quality were related significantly to adolescents' well-being, whereas age, ethnocultural background, educational level, and social media use were not (Table 3). Boys and adolescents with higher-quality friendships reported significantly higher well-being levels. Adding the interaction between social media use and friendship quality did not change model fit, as the interaction effect was not significant (B = –0.06, SE = 0.05, β= –0.03, $p = .245$).

The longitudinal version of Model B also revealed good model fit ($\chi^2(1) = 3.70$, $p = .055$, CFI = 1.00, RMSEA = 0.05, SRMR = 0.01). In the longitudinal model, gender, age, and

well-being at T1 were significant covariates; ethnocultural background and education level were not (Table 3). Thus, boys, older adolescents, and participants with higher well-being at T1 reported higher well-being at T2 than did girls, younger adolescents, adolescents with lower well-being at T1, respectively. In line with the cross-sectional model, adolescents with higher-quality friendships reported significantly higher levels of well-being one year later, and social media use was not related significantly to adolescents' well-being over time. The interaction between social media use and friendship quality was not significant (B = –0.07, SE = 0.05, β= –0.04, p = .121). Correspondingly, the model fit did not change.

Gender differences

Cross-sectionally, we found significant interaction effects of gender with social media use (B = –1.68, SE = 0.62, β = –0.11, p = .007) and friendship quality (B = 1.82, SE = 0.83, β= 0.09, p = .028) for adolescents' internalizing problems. Girls (but not boys) who used social media more frequently reported significantly more internalizing problems (B = 1.64, SE = 0.54, β = 0.12, p = .002; Figure 1). Boys and girls with higher-quality friendships reported significantly fewer internalizing problems; this association was significantly stronger for girls (B = –4.49, SE = 0.66, β = –0.30, p < .001) than for boys (B = –2.73, SE = 0.49, β = –0.26, p < .001; Figure 1). When including these significant gender interaction effects to the cross-sectional version of Model A, it showed satisfactory to good model fit ($\chi^2(2) = 21.69$, p < .001, CFI = 0.99, RMSEA = .09, SRMR = .04).

We also found a significant interaction effect between gender and social media for well-being (B = 0.21, SE = 0.07, β= 0.13, p = .003), with girls (but not boys) who used social media more frequently reporting significantly lower well-being (B = –0.14, SE = 0.05, β = –0.10, p = .007; Figure 1). The interaction effect between gender and friendship quality was not significant regarding adolescents' concurrent well-being (p > .05). The cross-sectional version of Model B including these two gender interaction terms also showed satisfactory to good model fit ($\chi^2(2) = 21.58$, p < .001, CFI = 0.99, RMSEA = .09, SRMR = .04).

The three-way interaction of gender × social media use × friendship quality was not significant for adolescents' concurrent internalizing problems or well-being. Accordingly, adding the three-way interaction effects revealed poor model fits for internalizing problems ($\chi^2(5) = 487.98$, p < .001, CFI = 0.76, RMSEA = .27, SRMR = .11) and well-being ($\chi^2(5) = 488.85$, p < .001, CFI = 0.75, RMSEA = .27, SRMR = .11). Longitudinal analysis revealed no significant two- or three-way interaction effect involving gender for internalizing problems or well-being.

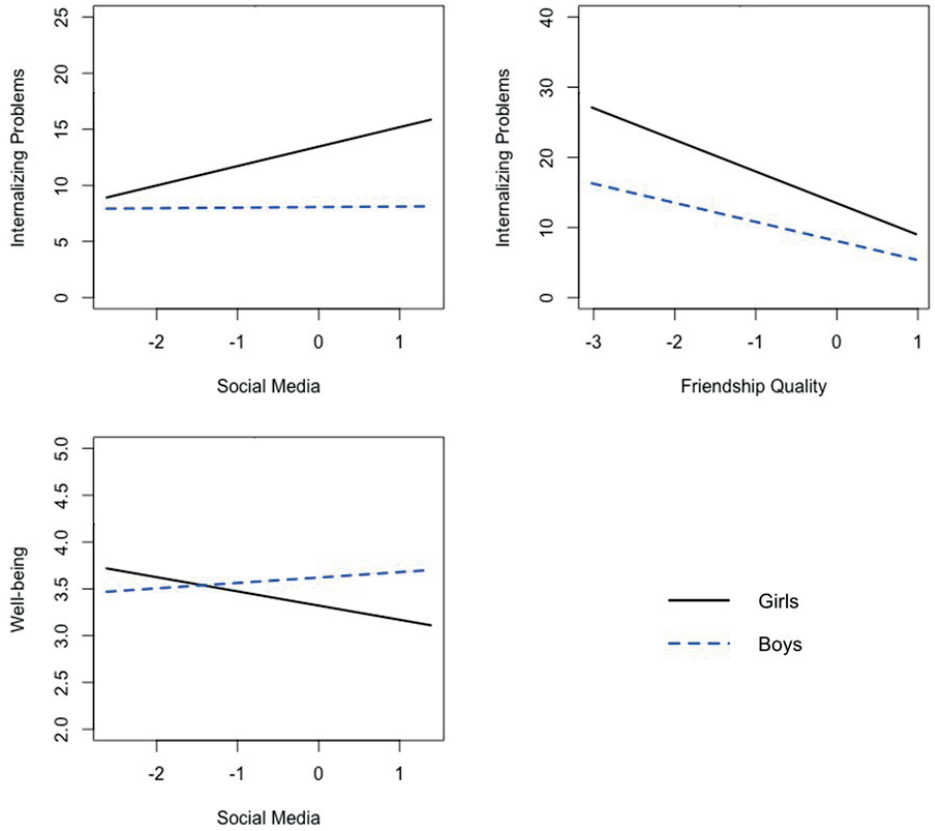

Figure 1. Significant two-way interaction effects of gender and social media use or friendship quality on adolescents' internalizing problems and well-being.

DISCUSSION

As adolescents spend increasing amounts of time using social media, increasing our understanding of the effects thereof on adolescents' internalizing problems and well-being is important (e.g., Clarke et al., 2015; Parkin et al., 2019). The present study explored associations of social media use and friendship quality with adolescents' internalizing problems and well-being concurrently and longitudinally, with testing for gender differences and interaction effects. We found that adolescent girls (but not boys) who used social media more frequently reported more concurrent internalizing problems and lower concurrent well-being, and that adolescents with higher-quality friendships reported fewer concurrent internalizing problems (this association was about twice as strong for girls than for boys) and higher concurrent and longitudinal well-being. These findings emphasize the need to employ gender-specific approaches to identify and decrease adolescents' internalizing problems and enhance their well-

Table 3. Cross-sectional and longitudinal main effects of social media use on adolescents' internalizing problems and well-being

	Model A						Model B					
	Internalizing problems T1			Internalizing problems T2			Well-being T1			Well-being T2		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Intercept	13.54	0.75	1.49***	13.47	0.69	1.31***	3.30	0.08	3.37***	3.33	0.07	3.46***
Gender	−5.42	0.50	−0.30***	−1.83	0.53	−0.09**	0.30	0.06	0.16***	0.25	0.05	0.13***
Age	0.04	0.23	0.01	−0.57	0.23	−0.06*	−0.02	0.03	−0.03	0.06	0.02	0.07*
Ethno-cultural background	−0.28	0.54	−0.02	0.14	0.54	0.01	0.06	0.06	0.03	−0.03	0.05	−0.02
Educational level	0.47	0.64	0.02	0.40	0.61	0.02	−0.11	0.07	−0.05	−0.13	0.07	−0.06
Internalizing problems T1				0.77	0.04	0.67***						
Well-being T1										0.58	0.03	0.58***
Social media use	0.84	0.31	0.08**	−0.18	0.33	−0.01	−0.03	0.04	−0.03	0.05	0.04	0.04
Friendship quality	−3.76	0.43	−0.28***	0.01	0.57	0.00	0.47	0.04	0.32***	0.10	0.05	0.07*

Note. *$p < .05$, **$p < .01$, ***$p < .001$. T1, spring 2018; T2, spring 2019; SE, standard error.

being, and the value of the dual-continuum perspective (i.e., separate examination of internalizing problems and well-being; Keyes, 2005) for research of this nature.

Our findings that girls use social media more frequently and have more internalizing problems and lower well-being than do boys confirm previous findings (Bartels et al., 2013; Kelly et al., 2018; Stevens et al., 2018). In addition to these mean differences between boys and girls, researchers have argued that girls are more prone than boys to experience adverse effects of more-frequent social media use on their internalizing problems and well-being, for instance because they have greater tendencies to ruminate about social media content and to compare themselves (e.g., their body images) with others appearing online (Nesi & Prinstein, 2015; Santarossa & Woodruff, 2017). Other reasons might be that, compared to boys, social media activities of girls may result in unwanted situations more often, including experiences of sexual harassment (e.g., sexual comments or jokes; showing sexual pictures; or spreading sexual rumors; Baumgartner et al., 2010; De Graaf et al., 2017; Petersen & Hyde, 2013). Thus, although scholars have raised concerns about the negative effects of social media use among all adolescents (Primack & Escobar-Viera, 2017; Underwood & Ehrenreich, 2017), our findings build on prior research and indicate that more-frequent social media use poses concurrent risks for girls' but not for boys' internalizing problems and well-being.

We found no longitudinal effect of social media use on adolescents' internalizing problems or well-being, which aligns with some recent studies (Beeres et al., 2020; Boer et al., 2020; Coyne et al., 2020) but challenges others (e.g., Kelly et al., 2018). In general, this finding demonstrates that our cross-sectional result that social media use poses risks for girls' internalizing problems and well-being does not provide information about the temporal sequence of involved processes or underlying mechanisms (Orben & Przybylski, 2019). Hence, potential explanations for our findings remain speculative. Social media use may have only short-term effects on adolescents' internalizing problems and well-being, which were not captured fully by assessment at a longer-term (1-year) interval in this study (Keijsers & Van Roekel, 2019). Another explanation might be that social media use can have negative as well as positive effects on adolescents' internalizing problems and well-being over time, which then even each other out. The positive psychological approach emphasizes the theoretical importance of considering the benefits of social media use, in addition to the disadvantages, to fully understand its effects on adolescents (De Leeuw & Buijzen, 2016). Recent empirical research indeed showed that social media use has positive as well as negative effects on adolescents' internalizing problems and well-being (Schønning et al., 2020; Seabrook et al., 2016; Wen et al., 2016). Additional longitudinal research on associations of adolescents' social media use with their internalizing problems and well-being is needed and

recommended to use more and shorter-time intervals and further explore the unique positive and negative effects of social media use.

Contrary to the theoretical hypotheses that we examined, which were based on theoretical and empirical research (e.g., Abbas & Mesch, 2018; Khan et al., 2016; Selfhout et al., 2009; Valkenburg & Peter, 2007), we found no significant interactions between social media use and friendship quality in relation to adolescents' internalizing problems or well-being concurrently or longitudinally. Thus, in the present study, adolescents' social media use and friendship quality did not mutually reinforce benefits (*rich-get-richer hypothesis*) or increase risks (*poor-get-poorer* hypothesis), nor did one compensate for (*poor-get-richer* hypothesis) or deteriorate (*rich-get-poorer* hypothesis) the other. Rather, we found that social media use and friendship quality play unique roles in adolescents' internalizing problems and well-being. Moreover, we found a greater strength of associations of friendship quality than social media use with adolescents' internalizing problems and well-being. Thus, building on previous theoretical and empirical findings (Gaertner et al., 2010; Raboteg-Šarić & Šakić, 2014; Schwartz-Mette et al., 2020), the present study indicates that high-quality (offline) friendships remain crucial to adolescents' concurrent internalizing problems and their concurrent and over-time well-being, despite increasing social media use. Indeed, the associations with girls' social media use in the current study were negative and significant but small in line with prior research (Orben & Przybylski, 2019). Furthermore, although we found no gender differences regarding the association between friendship quality and well-being, the concurrent association with internalizing problems was about twice as strong for girls than for boys. The fact that girls tend to co-ruminate (i.e., disclose and extensively discuss emotional problems in dyadic relationships) with friends more often than do boys (Smith, 2015), may affect the strength and over-time stability of the association between friendship quality and internalizing problems. Overall, these findings contribute to the existing body of literature indicating that adolescents' social media use and their (offline) friendship quality play unique roles in boys' and girls' internalizing problems and well-being.

The strengths of the current study include the participation of a large, culturally diverse sample of adolescents, the separate consideration of internalizing problems and well-being, the performance of cross-sectional and longitudinal assessments, and the simultaneous examination of social media use and friendship quality while testing for gender differences. However, some limitations of the present study need to be considered. First, as this research was based on adolescents' retrospective self-reports, our findings may be subject to response bias (Krumpal, 2013). Second, we used a single item to measure adolescents' time spent using social media. However, evidence

indicates that single-item measures have reliability and predictive validity comparable to those of multiple-item scales (Bergkvist & Rossiter, 2007;Wanous & Hudy, 2001), and the construct of social media use appears to be sufficiently homogeneous and clear to adolescents for adequate operationalization with a single item, as in previous research (e.g., Bevelander et al., 2018; Marino et al., 2016, 2020). As recent research suggests that not only the frequency of social media use, but also the problematic use of these media, affects adolescents' internalizing problems and well-being (Boer et al., 2020), we recommend additional longitudinal and multi-method research conducted with broader measures of social media use, including the extent to which it is problematic. Third, without replication, the results of this study cannot be generalized beyond our non-clinical school-based sample of Dutch adolescents. Adolescents in the Netherlands have the highest ranked well-being globally, and better friendships than do adolescents in other Western countries (Bradshaw et al., 2013). Studies conducted with other (sub-) clinical and non-clinical adolescent samples may differ. For instance, compared with their non-clinical peers, adolescents with (sub-)clinical mental health problems (e.g., depression) use social media more frequently (Sampasa-Kanyinga & Lewis, 2015; Uçar et al., 2020), perhaps because they have an unmet need for support or are concerned about what their friends will think. Thus, we recommend further research to determine whether the effects of social media use on adolescents' internalizing problems and well-being differs according to clinical status.

Notwithstanding these limitations, our findings are highly relevant for parents, teachers, and pediatric and mental health professionals, who must be aware of and address the risks that more-frequent social media use incurs for adolescent girls. We also recommend that mental health professionals treating adolescents prioritize the maintenance of these patients' existing friendships and encouragement that they form new (offline) friendships. This approach aligns well with the positive psychological approach (De Leeuw & Buijzen, 2016; Kobau et al., 2011), which proposes the identification and promotion of adolescents' strengths and resources to improve their well-being, even in the presence of risk factors (e.g., more-frequent social media use for girls). Moreover, these findings highlight the urgency of the need for policymakers to consider the effects of adolescent physical distancing during the current COVID-19 pandemic (Rogers et al., 2021), as online friendships do not replace (the benefits of) high-quality offline friendships.

REFERENCES

Abbas, R., & Mesch, G. (2018). Do rich teens get richer? Facebook use and the link between offline and online social capital among Palestinian youth in Israel. *Information, Communication & Society*, *21*(1), 63-79. https://doi-org.eur.idm.oclc.org/10.1080/1369118X.2016.1261168

Almquist, Y. B., Östberg, V., Rostila, M., Edling, C., & Rydgren, J. (2014). Friendship network characteristics and psychological well-being in late adolescence: exploring differences by gender and gender composition. *Scandinavian Journal of Public Health*, *42*(2), 146-154. https://doi.org/10.1177/1403494813510793

Bartels, M., Cacioppo, J. T., Van Beijsterveldt, T. C., & Boomsma, D. I. (2013). Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetics*, *43*(3), 177-190. https://doi.org/10.1007/s10519-013-9589-7

Baumgartner, S. E., Valkenburg, P. M., & Peter, J. (2010). Unwanted online sexual solicitation and risky sexual online behavior across the lifespan. *Journal of Applied Developmental Psychology*, *31*(6), 439-447. https://doi.org/10.1016/j.appdev.2010.07.005

Beeres, D. T., Andersson, F., Vossen, H. G., & Galanti, M. R. (2020). Social media and mental health among early adolescents in Sweden: a longitudinal study with 2-year follow-up (KUPOL Study). *Journal of Adolescent Health*, 1-8. https://doi.org/10.1016/j.jadohealth.2020.07.042

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588-606. https://doi.org/10.1037/0033-2909.88.3.588

Bergkvist, L., & Rossiter, J. R. (2007). The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research*, *44*(2), 175-184. https://doi.org/10.1509%2Fjmkr.44.2.175

Bevelander, K. E., Smit, C. R., van Woudenberg, T. J., Buijs, L., Burk, W. J., & Buijzen, M. (2018). Youth's social network structures and peer influences: study protocol MyMovez project–Phase I. *BMC Public Health*, *18*(1), 1-13. https://doi.org/10.1186/s12889-018-5353-5

Boer, M., Stevens, G. W., Finkenauer, C., de Looze, M. E., & van den Eijnden, R. J. (2020). Social Media Use Intensity, Social Media Use Problems, and Mental Health among Adolescents: Investigating Directionality and Mediating Processes. *Computers in Human Behavior*, Article 106645. https://doi.org/10.1016/j.chb.2020.106645

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210-230. https://doi.org/10.1111/j.1083-6101.2007.00393.x

Bradshaw, J., Martorano, B., Natali, L., & De Neubourg, C. (2013). Children's subjective well-being in rich countries. *Child Indicators Research*, *6*(4), 619-635. https://doi-org.eur.idm.oclc.org/10.1007/s12187-013-9196-4

Carr, C. T. , & Hayes, R. A. (2015). Social media: defining, developing, and divining. *Atlantic Journal of Communication*, *23*(1), 46–65. https://doi-org.eur.idm.oclc.org/10.1080/15456870.2015.972282

Centraal Bureau voor de Statistiek (2019). Internetgebruik onder jongeren. Retrieved September 12, 2020 from: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83429ned/table?fromstatweb

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 151–192). McGraw-Hill.

Clarke, A. M., Kuosmanen, T. & Barry, M. M. (2015). A Systematic Review of Online Youth Mental Health Promotion and Prevention Interventions. *Journal of Youth and Adolescence, 44*, 90-113. https://doi-org.eur.idm.oclc.org/10.1007/s12187-013-9196-4

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.

Cole, D. A., Nick, E. A., Varga, G., Smith, D., Zelkowitz, R. L., Ford, M. A., & Lédeczi, Á. (2019). Are aspects of Twitter use associated with reduced depressive symptoms? The moderating role of in-person social support. *Cyberpsychology, Behavior, and Social Networking, 22*(11), 692-699. https://doi.org/10.1089/cyber.2019.0035

Coyne, S. M., Rogers, A. A., Zurcher, J. D., Stockdale, L., & Booth, M. (2020). Does time spent using social media impact mental health?: An eight year longitudinal study. *Computers in Human Behavior, 104*, Article 106160. https://doi.org/10.1016/j.chb.2019.106160

De Graaf, H., van den Borne, M., Nikkelen, S., Twisk, D., & Meijer, S. (2017). *Seks onder je 25e: Seksuele gezondheid van jongeren in Nederland anno 2017*. Delft, The Netherlands: Eburon. Retrieved from

De Leeuw, R. N., & Buijzen, M. (2016). Introducing positive media psychology to the field of children, adolescents, and media. *Journal of Children and Media, 10*(1), 39-46. https://doi.org/10.1080/17482798.2015.1121892

Diener, E. (2009). Subjective well-being. In: E. Diener (Ed.), *The science of well-being* (pp. 11-58). Social Indicators Research Series, vol 37. Dordrecht: Springer.

Ebesutani, C., Reise, S. P., Chorpita, B. F., Ale, C., Regan, J., Young, J., Higa-McMillan, C., & Weisz, J. R. (2012). The Revised Child Anxiety and Depression Scale-Short Version: Scale reduction via exploratory bifactor modeling of the broad anxiety factor. *Psychological Assessment, 24*(4), 833-845. https://doi.org/10.1037/a0027283

Enders, C. K., & Bandalos, D. L. (2001) The Relative Performance of Full Information Maximum Likelihood Estimation for Missing Data in Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal, 8*(3), 430-457. https://doi.org/10.1207/S15328007SEM0803_5

Fardouly, J., Magson, N. R., Johnco, C. J., Oar, E. L., & Rapee, R. M. (2018). Parental control of the time preadolescents spend on social media: Links with preadolescents' social media appearance comparisons and mental health. *Journal of Youth and Adolescence, 47*(7), 1456-1468. https://doi.org/10.1007/s10964-018-0870-1

Furman, W., & Buhrmester, D. (2009). Methods and measures: The network of relationships inventory: Behavioral systems version. *International Journal of Behavioral Development, 33*(5), 470-478. https://doi.org/10.1177%2F0165025409342634

Gaertner, A. E., Fite, P. J., & Colder, C. R. (2010). Parenting and friendship quality as predictors of internalizing and externalizing symptoms in early adolescence. *Journal of Child and Family Studies, 19*(1), 101-108. https://doi-org.eur.idm.oclc.org/10.1007/s10826-009-9289-3

Gallagher, M. W., Lopez, S. J., & Preacher, K. J. (2009). The hierarchical structure of well-being. *Journal of Personality, 77*(4), 1025-1050. https://doi.org/10.1111/j.1467-6494.2009.00573.x

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Ivie, E. J., Pettitt, A., Moses, L. J., & Allen, N. B. (2020). A meta-analysis of the association between adolescent social media use and depressive symptoms. *Journal of Affective Disorders, 275*, 165-174. https://doi.org/10.1016/j.jad.2020.06.014

Kobau, R., Seligman, M. E., Peterson, C., Diener, E., Zack, M. M., Chapman, D., & Thompson, W. (2011). Mental health promotion in public health: Perspectives and strategies from positive psychology. *American Journal of Public Health*, *101*(8), e1-e9. https://doi.org/10.2105/AJPH.2010.300083

Keijsers, L., & van Roekel, E. (2019). Longitudinal methods in adolescent psychology: Where could we go from here? And should we? In L. B. Hendry & M. Kloep (Eds.), *Reframing adolescent research* (pp. 56-77). Routledge.

Kelly, Y., Zilanawala, A., Booker, C., & Sacker, A. (2018). Social media use and adolescent mental health: Findings from the UK Millennium Cohort Study. *EClinicalMedicine*, *6*, 59-68. https://doi-org.eur.idm.oclc.org/10.1016/j.eclinm.2018.12.005

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Khan, S., Gagné, M., Yang, L., & Shapka, J. (2016). Exploring the relationship between adolescents' self-concept and their offline and online social worlds. *Computers in Human Behavior*, *55*, 940-945. https://doi-org.eur.idm.oclc.org/10.1016/j.chb.2015.09.046

Koo, H. J., Woo, S., Yang, E., & Kwon, J. H. (2015). The double meaning of online social space: Three-way interactions among social anxiety, online social behavior, and offline social behavior. *Cyberpsychology, Behavior, and Social Networking*, *18*(9), 514-520. https://doi.org/10.1089/cyber.2014.0396

Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues*, *58*(1), 49-74. https://doi.org/10.1111/1540-4560.00248

Kriesi, I., Buchmann, M., & Jaberg, A. (2012). Educational success and adolescents' well-being in Switzerland. *Schweizerische Zeitschrift für Soziologie = Revue Suisse de Sociologie = Swiss Journal of Sociology*, *38*(2), 245-265. https://doi.org/10.5167/uzh-68739

Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: a literature review. *Quality & Quantity*, *47*(4), 2025-2047. https://doi.org/10.1007/s11135-011-9640-9

Lin, X., Su, W., & Potenza, M. N. (2018). Development of an online and offline integration hypothesis for healthy internet use: Theory and preliminary evidence. *Frontiers in Psychology*, *9*, Article 492. https://doi.org/10.3389/fpsyg.2018.00492

Luijten, C. C., Kuppens, S., Van de Bongardt, D., & Nieboer, A. P. (2019). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Dutch adolescents. *Health and Quality of Life Outcomes*, *17*(1), 157. https://doi.org/10.1186/s12955-019-1221-y

Luijten, C. C., Van de Bongardt, D., Jongerling, J., & Nieboer, A. P. (2021a). Associations between adolescents' internalizing problems and well-being: Is there a buffering role of boys' and girls' relationships with their mothers and fathers?. *BMC Public Health*, *21*(1), 1871. https://doi.org/10.1186/s12889-021-11920-4

Luijten, C. C., Van de Bongardt, D., Jongerling, J., & Nieboer, A. P. (2021). Longitudinal associations among adolescents' internalizing problems, well-being, and the quality of their relationships with their mothers, fathers, and close friends. *Social Science & Medicine*, *289*, 114387. https://doi.org/10.1016/j.socscimed.2021.114387

Marino, C., Gini, G., Angelini, F., Vieno, A., & Spada, M. M. (2020). Social norms and emotions in problematic social media use among adolescents. *Addictive Behaviors Reports*, 100250. https://doi-org.eur.idm.oclc.org/10.1016/j.abrep.2020.100250

Marino, C., Vieno, A., Pastore, M., Albery, I. P., Frings, D., & Spada, M. M. (2016). Modeling the contribution of personality, social identity and social norms to problematic Facebook use in adolescents.*Addictive behaviors*,*63*, 51-56. https://doi.org/10.1016/j.addbeh.2016.07.001

Moreno, M., & Kota, R. (2013). Social media. In V. C. Strasburger, B. Wilson, & A. B. Jordan (Eds.), *Children, adolescents, and the media* (3rd ed.). Sage. Retrieved October 5, 2020 from https://nls.ldls.org.uk/welcome.html?ark:/81055 /vdc_10002 54214 90.0x000001.

Nesi, J., & Prinstein, M. J. (2015). Using social media for social comparison and feedback-seeking: Gender and popularity moderate associations with depressive symptoms. *Journal of Abnormal Child Psychology*,*43*(8), 1427-1438. https://doi.org/10.1007/s10802-015-0020-0

Orben, A. (2020). Teenagers, screens and social media: a narrative review of reviews and key studies. *Social Psychiatry and Psychiatric Epidemiology*, *55*, 1-8. https://doi.org/10.1007/s00127-019-01825-4

Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour*, *3*(2), 173-182. https://doi.org/10.1038/s41562-018-0506-1

Parkin, E., Long, R., & Gheera, M. (2019). *Children and young people's mental health: policy, services, funding and education* (No. 07196). House of Commons Library. Retrieved September 10, 2020 from: https://dera.ioe.ac.uk/30819/1/CBP-7196%20_Redacted.pdf

Petersen, J. L., & Hyde, J. S. (2013). Peer sexual harassment and disordered eating in early adolescence. *Developmental Psychology*, *49*(1), 184-195. https://doi-org.eur.idm.oclc.org/10.1037/a0028247

Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and classification* (Vol. 1). Oxford University Press.

Petropoulos Petalas, D., Konijn, E. A., Johnson, B. K., Veldhuis, J., Bij de Vaate, N. A., Burgers, C., ... & van de Schoot, R. (2021). Plurality in the Measurement of Social Media Use and Mental Health: An Exploratory Study Among Adolescents and Young Adults. *Social Media + Society*, *7*(3), 1-19. https://doi-org.eur.idm.oclc.org/10.1177%2F20563051211035353

Primack, B. A., & Escobar-Viera, C. G. (2017). Social media as it interfaces with psychosocial development and mental illness in transitional age youth. *Child and Adolescent Psychiatric Clinics of North America*, *26*(2), 217-233. https://doi.org/ 10.1016/j.chc.2016.12.007

Raboteg-Šarić, Z., & Šakić, M. (2014). Relations of parenting styles and friendship quality to self-esteem, life satisfaction and happiness in adolescents.*Applied Research in Quality of Life*,*9*, 749-765. https://doi.org/10.1007/s11482-013-9268-0

Rogers, A. A., Ha, T., & Ockey, S. (2021). Adolescents' Perceived Socio-Emotional Impact of COVID-19 and Implications for Mental Health: Results From a US-Based Mixed-Methods Study. *Journal of Adolescent Health*, *68*(1), 43-52. https://doi.org/10.1016/j.jadohealth.2020.09.039

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA).*Journal of Statistical Software*, *48*, 1-36. Retrieved September 10, 2020 from: https://users.ugent.be/~yrosseel/lavaan/lavaanIntroduction.pdf

Rudolph, K. D., & Conley, C. S. (2005). The socioemotional costs and benefits of social-evaluative concerns: Do girls care too much?. *Journal of Personality*, *73*(1), 115-138. https://doi-org.eur.idm.oclc.org/10.1111/j.1467-6494.2004.00306.x

Salmela-Aro, K., & Tynkkynen, L. (2010). Trajectories of life satisfaction across the transition to post-compulsory education: Do adolescents follow different pathways?. *Journal of Youth*

and Adolescence, *39*(8), 870-881. https://doi-org.eur.idm.oclc.org/10.1007/s10964-009-9464-2

Sampasa-Kanyinga, H., & Lewis, R. F. (2015). Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents. *Cyberpsychology, Behavior, and Social Networking*,*18*(7), 380-385. https://doi.org/10.1089/cyber.2015.0055

Santarossa, S., & Woodruff, S. J. (2017). # SocialMedia: Exploring the relationship of social networking sites on body image, self-esteem, and eating disorders. *Social Media + Society*, *3*(2), 1-10. https://doi-org.eur.idm.oclc.org/10.1177%2F2056305117704407

Sarmiento, I. G., Olson, C., Yeo, G., Chen, Y. A., Toma, C. L., Brown, B. B., Bellmore, A., & Mares, M. L. (2018). How does social media use relate to adolescents' internalizing symptoms? Conclusions from a systematic narrative review. *Adolescent Research Review*, *5*, 381-404. https://doi.org/10.1007/s40894-018-0095-2

Sass, D. A., Schmitt, T. A., & Marsh, H. W. (2014). Evaluating model fit with ordered categorical data within a measurement invariance framework: A comparison of estimators. *Structural Equation Modeling: A Multidisciplinary Journal*, *21*(2), 167-180. https://doi.org/10.1080/10705511.2014.882658

Schønning, V., Hjetland, G. J., Aarø, L. E., & Skogen, J. C. (2020). Social Media Use and Mental Health and Well-Being Among Adolescents–A Scoping Review. *Frontiers in Psychology*, *11*, Article 1949. https://doi.org/10.3389/fpsyg.2020.01949

Schwartz-Mette, R. A., Shankman, J., Dueweke, A. R., Borowski, S., & Rose, A. J. (2020). Relations of friendship experiences with depressive symptoms and loneliness in childhood and adolescence: A meta-analytic review. *Psychological Bulletin*, *146*(8), 664-700. https://doi.org/10.1037/bul0000239

Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: a systematic review.*JMIR Mental Health*,*3*(4), e50. http://dx.doi.org/10.2196/mental.5842

Selfhout, M. H., Branje, S. J., Delsing, M., ter Bogt, T. F., & Meeus, W. H. (2009). Different types of Internet use, depression, and social anxiety: The role of perceived friendship quality. *Journal of Adolescence*,*32*(4), 819-833. https://doi-org.eur.idm.oclc.org/10.1016/j.adolescence.2008.10.011

Smith, R. L. (2015). Adolescents' emotional engagement in friends' problems and joys: Associations of empathetic distress and empathetic joy with friendship quality, depression, and anxiety. *Journal of Adolescence*, *45*, 103-111. https://doi.org/10.1016/j.adolescence.2015.08.020

Stevens, G. W. J. M., Van Dorsselaer, S., Boer, M., de Roos, S., Duinhof, E. L., ter Bogt, T. F. M., van den Eijnden, R., Kuyper, L., Visser, D., Vollebergh, W., & de Looze, M. (2018). *HBSC 2017. Gezondheid en welzijn van jongeren in Nederland [Health and well-being of young people in the Netherlands]*. Utrecht: Universiteit Utrecht. Retrieved December 9, 2020 from: https://hbsc-nederland.nl/wp-content/uploads/2018/09/Rapport-HBSC-2017.pdf

Uçar, H. N., Çetin, F. H., Ersoy, S. A., Güler, H. A., Kılınç, K., & Türkoğlu, S. (2020). Risky cyber behaviors in adolescents with depression: A case control study. *Journal of Affective Disorders*, *270*, 51-58. https://doi.org/10.1016/j.jad.2020.03.046

Underwood, M. K., & Ehrenreich, S. E. (2017). The power and the pain of adolescents' digital communication: Cyber victimization and the perils of lurking. *American Psychologist*, *72*(2), 144-158. https://doi.org/10.1037/a0040429

Vacek, K. R., Coyle, L. D., & Vera, E. M. (2010). Stress, self-esteem, hope, optimism, and well-being in urban, ethnic minority adolescents. *Journal of Multicultural Counseling and Development*, *38*(2), 99-111. https://doi.org/10.1002/j.2161-1912.2010.tb00118.x

Valkenburg, P. M., & Peter, J. (2007). Preadolescents' and adolescents' online communication and their closeness to friends. *Developmental Psychology*, *43*(2), 267-277. https://doi.org/10.1037/0012-1649.43.2.267

Van de Bongardt, D., Reitz, E., & Deković, M. (2016). Indirect over-time relations between parenting and adolescents' sexual behaviors and emotions through global self-esteem. *The Journal of Sex Research*, *53*(3), 273-285. https://doi.org/10.1080/00224499.2015.1046155

Wanous, J. P., & Hudy, M. J. (2001). Single-item reliability: A replication and extension.*Organizational Research Methods*,*4*(4), 361-375. https://doi.org/10.1177%2F109442810144003

Wen, Z., Geng, X., & Ye, Y. (2016). Does the use of WeChat lead to subjective well-being?: the effect of use intensity and motivations. *Cyberpsychology, Behavior, and Social Networking*, *19*(10), 587-592. https://doi.org/10.1089/cyber.2016.0154

You, S., Lim, S. A., & Kim, E. K. (2018). Relationships between social support, internal assets, and life satisfaction in Korean adolescents. *Journal of Happiness Studies*, *19*(3), 897–915. https://doi-org.eur.idm.oclc.org/10.1007/s10902-017-9844-3.

Yuan, K. H. and Bentler, P. M. (2000). 5. Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology*, *30*, 165-200. https://doi.org/10.1111%2F0081-1750.00078

Yucel, D., & Yuan, A. S. V. (2016). Parents, siblings, or friends? Exploring life satisfaction among early adolescents. *Applied Research in Quality of Life*, *11*(4), 1399-1423. https://doi.org/10.1007/s11482-015-9444-5

Zhang, S., Baams, L., van de Bongardt, D., & Dubas, J. S. (2018). Intra-and inter individual differences in adolescent depressive mood: The role of relationships with parents and friends. *Journal of Abnormal Child Psychology*, *46*(4), 811-824. https://doi.org/10.1007/s10802-017-0321-6

6

Adolescents' friendship quality and over-time development of well-being: The explanatory role of self-esteem

This paper is currently in revision as:
Luijten, C. C., Van de Bongardt, D., & Nieboer, A. P. (2022). Adolescents' friendship quality and over-time development of well-being: the explanatory role of self-esteem.

7

General discussion

GENERAL DISCUSSION

Adolescent mental health is currently a priority in research, clinical and educational practice, and public health policy development (Parkin et al., 2019; Rijksoverheid, 2022; World Health Organization, 2013; Wykes et al., 2021). This focus is related to observed declines in well-being and increases in internalizing problems among adolescents globally in the last decade (e.g., Bor et al., 2014; Kassebaum et al., 2017; Maciejewski et al., 2015; Potrebny et al., 2017; Thorisdottir et al., 2017). Moreover, after the start of the COVID-19 pandemic, there has been an even steeper decline in adolescent mental health (e.g., Munasinghe et al., 2020; Van der Laan et al., 2021; Von Soest et al., 2020; Zolopa et al., 2022). It is critical to identify factors that protect and promote adolescent mental health for the development of early prevention and intervention. Therefore, the main aim of the research conducted for this dissertation was to better understand potential risk and protective factors associated with adolescents' mental health from a psychosocial perspective (Reith-Hall, 2019), by examining the interplay between individual factors (e.g., gender, global self-esteem) and social relationships (with parents and friends) and their linkages with adolescent well-being and internalizing problems.

Well-being and internalizing problems

The concepts of well-being and internalizing problems are often used interchangeably in the literature. However, while they are both important parts of mental health, they are not the same. In line with the dual-continuum model (Keyes, 2005) and earlier research (Clark & Malecki, 2022; Karaś et al., 2014; Lim, 2014; Petrillo et al., 2015; Singh et al., 2015), the study addressed in Chapter 2 confirmed that well-being and internalizing problems were related, yet distinct continua, rather than opposite ends of a single continuum. However, while the dual-continuum model proposes that adolescents with internalizing problems can have low(er) as well as high(er) levels of well-being and vice versa, the studies presented in Chapters 3 and 4 demonstrate that internalizing problems are a risk factor for adolescents' well-being, concurrently for boys and girls (research question 2, Chapter 3) and over-time only for girls (research question 3, Chapter 4). More specifically, internalizing problems were not indirectly (via the quality of relationships with mothers, father, or close friends) but directly related to subsequent well-being (research question 3, Chapter 4). This indicates that internalizing problems are a direct risk factor for well-being, and shows yet again that the dual-continuum model is valuable but also has its limitations. Chapter 5 illustrates the advantage of studying both concepts as mental health outcomes relative to one another. The results indicated unique pathways from friendship quality to well-being, on the one hand, and to internalizing problems, on the other hand. These findings, along with recent

research (e.g., Eriksson et al., 2019), indicate that well-being and internalizing problems are critical aspects of mental health that together must be addressed to improve adolescents' mental health.

In terms of operationalization, Chapter 2 evaluated the factor structure, internal consistency, construct validity, and gender and age invariance of the 14-item Mental Health Continuum-Short Form (MHC-SF) among Dutch adolescents to ensure accurate measurement of adolescents' well-being. In line with prior research (for a review, see Iasiello et al., 2022), the MHC-SF was found to be a reliable and valid instrument for the measurement of Dutch adolescent well-being with the same level of accuracy in boys and girls and across different age groups (research question 1). Moreover, due to its brevity and cross-contextual utility (for a review, see Iasiello et al., 2022), the MHC-SF is highly suitable for scientific and epidemiological monitoring of adolescent mental health including well-being, and as such, was used for the further evaluation of adolescent well-being in this dissertation.

Parents and adolescent mental health

In our concurrent psychosocial model in which internalizing problems and mother– and father–adolescent relationship quality were studied in relation to adolescents' well-being, the quality of adolescents' relationships with their parents did not buffer the link between internalizing problems and well-being (research question 2, Chapter 3). Thus, more internalizing problems were related to lower well-being, regardless of higher- or lower-quality relationships with parents. Although theory suggests buffering effects of high-quality relationships with parents, more empirical support exists for their main effects (Lakey & Orehek, 2011; Yucel & Yuan, 2016). Accordingly, the current study found that parent–adolescent relationship quality was positively related to adolescent well-being and revealed a stronger association with the mother–adolescent relationship than father–adolescent relationship (Chapter 3). In other words, adolescents with higher-quality parental relationships, especially with mothers, reported higher well-being, even when they experienced internalizing problems.

Results of our longitudinal study (Chapter 4) that included internalizing problems, the quality of adolescents' relationships with parents and close friends, and controlled for baseline levels of well-being, indicated that mother– and father–adolescent relationship quality were not related to adolescents' well-being over time. However, in line with earlier research (Branje et al., 2010; Burke et al., 2017; Cortés-García et al., 2019), internalizing problems were related to the subsequent quality of adolescents' relationships with parents. Both boys and girls with more internalizing problems reported lower-quality relationships with mothers and fathers one year later, even

while including friendship quality in the model and controlling for baseline parental relationship quality.

Together, these results indicate important linkages between the quality of relationships with parents and mental health in adolescents. The quality of adolescents' relationship with their mothers proved to play a stronger role in concurrent well-being than the quality of their relationship with their fathers. While prior studies of parent–adolescent relationship quality have generally not distinguished between relationships with mothers and fathers (e.g., Dinizulu et al., 2014; Kim et al., 2015; Martin-Storey et al., 2021; Withers et al., 2017), the current dissertation emphasizes that these relationships are not interchangeable, which is fully in accord with the family system theory (e.g., Cox & Paley, 1997). In fact, and in line with our findings, mothers are a primary attachment figure during adolescence (Keizer et al., 2019; Rosenthal & Kobak, 2010), while fathers also play a significant role in adolescent well-being that should not be neglected (Magson et al., 2021; Mak et al., 2020). Future (longitudinal) research should continue to study the roles of both parents in adolescent mental health. In addition, future studies may benefit from studying other family forms (e.g., one-parent, same-sex parent, or patchwork families), as such diverse family structures may play varying important roles in adolescents' mental health (e.g., Bos et al., 2018; Park & Lee, 2020; Schumm, 2016).

Close friends and adolescent mental health

Based on concurrent psychosocial models, including friendship quality and social media use in relation to adolescents' well-being and internalizing problems, the present dissertation research found that adolescents with higher-quality friendships report higher well-being and fewer internalizing problems (research question 4, Chapter 5). Although these relationships were significant across gender, the association between friendship quality and internalizing problems was approximately twice as strong for girls than for boys. In our multiple examined longitudinal psychosocial models (Chapters 4, 5, and 6), friendship quality was found to be significantly linked to boys' but not girls' subsequent well-being. No over-time link between friendship quality and internalizing problems was found based on the psychosocial model that included friendship quality and social media use in association with subsequent internalizing problems, while controlling for baseline internalizing problems (research question 4, Chapter 5). The cross-sectional results align with prior research indicating the importance of friendship quality for adolescent mental health (Raboteg-Šarić & Šakić, 2014; Schwartz-Mette et al., 2020), with girls typically socialized to value social relationships more (You et al., 2018) and being generally more sensitive to social influences (Cialdini & Trost, 1998; Rudolph & Conley, 2005) than boys. However, the longitudinal results of the current dissertation revealed the importance of higher-quality friendships in adolescent boys'

well-being in particular, indicating that the role of friendships should certainly not be overlooked in boys.

In the opposite direction, based on the longitudinal psychosocial model addressing adolescents' internalizing problems and the quality of relationships with parents and close friends in association with well-being, internalizing problems were found to be negatively related to the quality of close friendships (Chapter 4). In other words, and in agreement with prior research (Branje et al., 2010; Flynn & Rudolph, 2014; Kochel et al., 2012; Rudolph et al., 2009; Young & Mufson, 2008), adolescents with more internalizing problems reported lower-quality relationships with close friends over time. Thus, similar to the finding for parents, more internalizing problems also appeared to be a risk factor to experiencing higher-quality friendships.

Regarding the digital context of adolescent mental health, the study presented in Chapter 5 demonstrated significant concurrent but no over-time relationships between social media use and internalizing problems and well-being in girls (but not boys). Thus, although scholars have raised concerns about the negative effects of social media use among all adolescents (Primack & Escobar-Viera, 2017; Underwood & Ehrenreich, 2017), this dissertation emphasizes the concurrent mental health risks particularly for girls. There was no interaction between friendship quality and social media use, suggesting that social media use and friendship quality play unique roles in well-being and internalizing problems in adolescents, with friendship quality being more strongly associated with mental health than social media use. Building on previous theoretical and empirical findings (Gaertner et al., 2010; Raboteg-Šarić & Šakić, 2014; Schwartz-Mette et al., 2020), the present dissertation thus indicates that higher-quality (offline) friendships remain crucial to minimizing concurrent internalizing problems and maximizing concurrent and over-time well-being, even in the context of the increasing amounts of online social media use.

Global self-esteem as a mechanism underlying the link between friendship quality and well-being

Building on the observed importance of friendship quality in concurrent and over-time well-being, a potential mechanism by which friendship quality is important to adolescent well-being was examined. Social cognitive theory suggests that associations between social environmental factors and well-being may be mediated by individual cognitive factors (Bandura, 2001). In the present dissertation, global self-esteem was proposed as a mediating factor underlying the longitudinal link between friendship quality and well-being in adolescents (research question 5, Chapter 6). In accordance with the earlier discussed finding that there is a significant link between friendship

quality and boys' but not girls' subsequent well-being, for girls our results established no traditional mediation, for which a significant direct effect between an independent variable and a dependent variable (i.e., between friendship quality and well-being) is required (Baron & Kenny, 1986). However, a significant indirect effect between friendship quality and well-being via girls' global self-esteem was found. Specifically, in girls, higher-quality friendships predicted higher global self-esteem, which, in turn, predicted higher levels of well-being one year later. For boys, neither a traditional mediating effect, nor an indirect effect was found over time. Rather, in addition to the significant direct link between friendship quality and boys' subsequent well-being, boys with higher-quality friendships reported higher concurrent global self-esteem. In line with previous findings (Farineau et al., 2013; Raboteg-Šarić & Šakić, 2014; Way, 2011), these results indicate the importance of the social peer environment, specifically the perceived quality of close friendships, to girls' and boys' global self-esteem and well-being.

Gender similarities and differences

There has been an increasing interest in the role of gender in adolescent mental health, specifically well-being and internalizing problems. Therefore, the final goal of the current dissertation was to better understand the differences and similarities between girls and boys in the studied associations. In the empirical studies that were described in the previous chapters, various univariate gender differences were found among investigated variables. In line with prior research (Bartels et al., 2013; Henkens et al., 2022; Stevens et al., 2018), girls reported lower well-being and more internalizing problems than boys. Also in agreement with previous research (Kelly et al., 2018; Raboteg-Šarić & Šakić, 2014), girls reported higher-quality friendships and more frequent social media use than boys. However, in contrast to prior research (Van Eijck et al., 2012), in the current study, girls reported lower-quality relationships with their parents compared to boys. Finally, also in accordance with earlier research (Keizer et al., 2019; Moksnes & Reidunsdatter, 2019), girls reported lower global self-esteem than boys.

In addition to these univariate gender differences, both gender similarities and gender differences were detected in the relations between the investigated psychosocial factors and adolescent well-being. These similarities and differences are discussed based on the cross-sectional analyses, followed by the longitudinal analyses. Remarkably, the cross-sectional findings mostly indicated gender similarities, as all significant associations among internalizing problems, the quality of relationships with parents and close friends, and well-being discussed above were found to be gender invariant. As an exception, two concurrent gender differences were found. First, while

significant across gender, the negative association between friendship quality and internalizing problems was significantly stronger for girls than for boys. This result indicates that although higher-quality friendships are important regarding internalizing problems of adolescents in general, they are especially important for girls. Second, results presented in Chapter 5 indicated that more frequent social media use posed a significant concurrent risk for girls' but not for boys' mental health.

In addition to the cross-sectional gender similarities, there were also longitudinal similarities among boys and girls. Both boys and girls with more internalizing problems at baseline reported lower-quality relationships with parents and close friends over time. Two longitudinal gender differences were found. First, more reported internalizing problems were related to lower well-being over time for girls, but not for boys. Second, higher-quality friendships were directly related to higher well-being after one year for boys, while this relationship was indirectly linked via higher global self-esteem for girls.

In general, these findings align with prior research (Hartas, 2021; Kleinjan et al., 2020) suggesting that girls have in many ways a riskier profile for mental health based on reports of lower-quality relationships with parents, more frequent social media use, and lower global self-esteem than boys. Moreover, while the quality of friendships is often found to play a particularly important role in mental health for girls (Almquist et al., 2014), the current dissertation revealed that friendship quality is indirectly related to well-being via global self-esteem in girls, while being directly related to over-time well-being in boys. Overall, these findings indicate that gender-specific analyses are needed in the study of adolescent mental health from a psychosocial perspective.

Strengths and limitations

The current dissertation addressed several important theoretical and empirical research gaps regarding 1) our understanding of well-being and internalizing problems, both as important complementary yet distinct parts of mental health, 2) the unique roles of mothers and fathers, 3) the role of peers, specifically close friends, and 4) the differences and similarities between girls and boys in these relationships.

Despite these important contributions, there are also limitations. First, the sample consisted of a general school population of non-clinical Dutch adolescents, most of whom reported relatively high levels of well-being, relatively few internalizing problems, and relatively high-quality relationships with their parents and friends. Consequently, in the longitudinal analyses, there was little variance attributable to psychosocial factors, especially in light of the stability of our sample's relatively high levels over time and the strict longitudinal designs (i.e., controlling for baseline mental

health levels). This may explain some of the null findings in our longitudinal analyses compared to the significant cross-sectional findings. It is expected that more significant longitudinal findings may be found with a more varied sample, including adolescents with elevated levels of depression (Uçar et al., 2020) and adolescents experiencing poor mental health or unmet mental health support (Sampasa-Kanyinga & Lewis, 2015). Thus, replication in other (inter)national and/or (sub-)clinical samples is necessary to investigate the robustness of our findings and generalizability to adolescent populations in other contexts.

Second, we had planned to collect data at three time points to investigate mental health from a developmental perspective over time. Unfortunately, the third wave of data collection was canceled due to school closures during the first lockdown of the COVID-19 pandemic. We therefore collected data at only two time points: in spring 2018 and spring 2019, both pre-pandemic. Over the past two years (since the start of the pandemic), national and international research has revealed a significant deterioration in adolescent mental health (GGD GHOR Nederland, 2022; Munasinghe et al., 2020, Von Soest et al., 2020). While effects of the COVID-19 pandemic on adolescents' well-being and internalizing problems fell outside the scope of this dissertation, we expect the observed results to persist (perhaps more strongly) during and after the pandemic. The psychosocial factors, particularly higher-quality friendships, that appeared important for adolescent mental health in the current dissertation may be precisely those factors that were negatively impacted due to the social isolation brought about by the COVID-19 pandemic (Van de Bongardt & Peer Relations Researchers network, 2020). Thus, it is critical to continue the study of the impact of psychosocial factors on mental health in adolescents during and after the COVID-19 pandemic to develop better and more targeted protection and promotion.

Third, to study gender differences and similarities, participants in the present research were asked in the questionnaire whether they were a boy or a girl. We fully acknowledge that our binary approach is rather traditional, and the contemporary Dutch societal context requires the acknowledgement of the multiplicity of both biological sex and socio-cultural gender identities (e.g., De Graaf et al., 2017). A recent study comparing existing cross-country practices in measuring sex and gender (Motmans et al., 2020) revealed that including broader gender identity (which should include non-binary options) as well as gender assigned at birth is preferrable over a binary question. Moreover, research increasingly demonstrates that adolescents with gender identities that do not match their sex or gender assigned at birth constitute a particularly vulnerable mental health population (e.g., reporting increased internalizing problems;

Durbeej et al., 2019; Ghassabian et al., 2022). These are important suggestions for future studies on adolescent mental health, internalizing problems and well-being.

One final limitation lies in the way in which social media use was measured in the current study: as a single item asking only about frequency of use of social networking sites or apps (e.g., WhatsApp, Facebook, Instagram, and Snapchat). Although the construct of social media use appears to be sufficiently homogeneous and clear to adolescents for adequate operationalization with a single item (e.g., Bevelander et al., 2018; Marino et al., 2016, 2020), future research may benefit from using multi-item scales to assess a more detailed understanding of contemporary adolescents' social media use (e.g., better time resolution, distinguishing in week- or weekend-days, or number of hours). Additionally, prior studies indicate the relevance to assess the type of social media use, distinguishing between posting, chatting, and scrolling, in association with mental health (Boer et al., 2022; Verduyn et al., 2017). Future longitudinal and multi-method research with broader measures of social media use is recommended.

Directions for future research

In addition to the directions for future research that have already been discussed in the previous sections, five important additional theoretical and methodological suggestions are provided.

Theoretical and conceptual suggestions

First, within the scope of this dissertation, mental health was employed as the outcome variable in our hypothesized models. However, the relationships between psychosocial factors and mental health may be reciprocal. The study presented in Chapter 4 showed that internalizing problems are related to the subsequent quality of adolescents' relationships with parents and close friends, in agreement with previous research (Branje et al., 2010; Burke et al., 2017; Cortés-García et al., 2019). Research studying the potential reciprocal relationships between the quality of adolescents' proximal social relationships and well-being is limited. Yet, one recent study indicates bidirectional relationships between adolescents' well-being, measured as positive affect, and high-quality relationships with parents and peers (Griffith et al., 2021). Therefore, it is recommended that future longitudinal research aims to further increase our understanding of the directionality of these complex interrelationships between psychosocial factors and mental health among adolescents.

Second, the present dissertation applied a psychosocial perspective with a focus on the quality of adolescents' most proximal relationships with parents and friends. While relationship quality encompasses positive (i.e., satisfaction) and negative (i.e., conflict)

aspects, it may be relevant to study other elements of parent–adolescent and peer relationships, including parental communication and control (De Looze et al., 2020), and peer acceptance or victimization (Schacter et al., 2021). Furthermore, the quality of adolescents' peer relationships with their siblings (Buist et al., 2013; Dirks et al., 2015) and romantic partners (Gómez-López et al., 2019) have also been associated with adolescents' mental health. Future research is recommended to expand the study of adolescents' multiple social relationships in relation to their mental health.

Third, future research is recommended to apply a biopsychosocial model and include also the physical dimensions of health and well-being such as feeling ill, pain, physical disabilities, or experiencing weakness or exhaustion (Bullinger et al., 2008). There is considerable empirical evidence that mental and physical health and well-being, including depression, anxiety, life satisfaction, and physical experiences such as cardiovascular symptoms, illness, headaches, and weakness, are interdependent (Begen & Turner-Cobb, 2012; Brendgen & Vitaro, 2008; Gadermann et al., 2016; McCloughen et al., 2012; Murillo et al., 2017; Umberson & Montez, 2010). However, to date, limited studies have investigated the pathways linking adolescents' mental and physical health and well-being, even more so in association with their social relationships.

Methodological suggestions

In addition to the abovementioned theoretical suggestions, the following methodological suggestions are proposed. First, increasing the number of data collection time points would contribute to our understanding of the (bi-)directionality between adolescents' mental health and the psychosocial factors (e.g., Van Eijck et al., 2012). Second, future research may use shorter time intervals to gain a better understanding of the dynamic processes that underly the relationships between adolescents' mental health and psychosocial factors. Adolescence is characterized by many physical, emotional, and social transformations, and thus is a dynamic period during which risk and protective factors of mental health may fluctuate continuously (Branje et al., 2010; Nelemans et al., 2014). Accordingly, when using short-time intervals, it may be valuable to apply person-specific designs and within-person analyses (e.g., random-intercept cross-lagged panel models (RI-CLPM) and dynamic structural equation modeling (DSEM) for intensive longitudinal data analyses; Asparouhov et al., 2018; McNeish & Hamaker, 2020) to provide a better understanding of adolescents who develop relatively stable compared to adolescents who develop with more fluctuations in their mental health (e.g., Beyens et al., 2020; Pouwels et al., 2022). This will benefit a more personal and tailored approach to the support of adolescent mental health.

Relevance for parents, teachers, and prevention and intervention practices

The findings of this dissertation suggest a holistic approach, including both proximal and distal contexts (Laser & Nicotera, 2021), to prevention and intervention practices aimed at protecting and promoting adolescent mental health. In a proximal context, the present dissertation will benefit parents and teachers who want to better understand how to promote adolescent mental health. Parents should foster a warm, close, and supportive relationship with their children. In addition, as higher-quality friendships were found to be a relevant protective factor for adolescent mental health, teachers and parents can help to ensure that adolescents establish and maintain friendships. This could include a stronger focus on helping adolescents connect with one another on a deeper dyadic level and teaching more adaptive methods of interacting. Teachers and school counselors can also monitor classroom peer dynamics so that adolescents whose mental health is at risk can be readily identified and appropriately supported (Steinweg et al., 2021). It should be taken into consideration that while it is somewhat beneficial for parents and teachers to be concerned with adolescent mental health and friendships, too much involvement can cause more harm than good. For instance, strict behavioral control or parental disapproval has been shown to promote stronger affiliations with deviant friends and delinquency (for a review, see Meeus, 2016).

The present dissertation also provides implications for prevention and intervention strategies in a more distal context. In the Netherlands, the Ministry of Health, Welfare and Sport initiated a governmental approach called "Mental health: for all of us" and included well-being in the National Education Program, indicating that adolescent mental health is a national priority (Rijksoverheid, 2022). Multiple programs exist that aim to protect and promote Dutch adolescents' mental health, focusing most often on internalizing problems (e.g., Head Up!) or on well-being (e.g., 'Gezonde School'; Nederlands Jeugd Instituut, 2022; Van Dale et al., 2022). In line with recent literature (Van Bon-Martens et al., 2022a) and based on the current dissertation's findings demonstrating the relevance of addressing both well-being and internalizing problems, it is crucial that prevention and intervention programs (are combined to) improve both aspects of mental health. One example of such a program is 'Happyles' (Nederlands Jeugd Instituut, 2022). Furthermore, it may be relevant to address some more functional aspects of mental health in research and practice too, such as resilience, indicating the ability or capacity of adolescents to effectively cope with their (changing) environment (Fusar-Poli et al., 2020; Van Bon-Martens et al., 2022b; Van den Brink et al., 2021). This seems particularly important in light of the COVID-19 pandemic, but also in light of digitalization and climate change.

In addition to prevention and intervention programs needing to focus on well-being as well as internalizing problems, the present dissertation indicates the necessity of focusing on quality of adolescents' close friendships (Allen et al., 2022). Peer-to-peer support or peer education programs, such as 'Kopkracht', MIND Young Academy, and Topper Training, may be particularly beneficial to the protection and promotion of mental health during adolescence. While Topper training appeared to significantly decrease internalizing problems (Vliek et al., 2019), empirical evidence for other such peer-including programs is limited. More effectiveness and implementation studies are needed and, rather than developing new interventions, a holistic and integrated approach in which existing initiatives, actions, and measures reinforce each other is suggested. Integrated programs spread over a longer period of time, in which teachers receive good training, parents receive parenting support, and adolescents are supported in in their well-being appear to be most effective (Lammers & Kleinjan, 2022). This also recommends programs to be implemented holistically in multi-settings (Busch et al., 2013; De Haan Keij, & Lammers, 2021), including families, friends, school health services, and afterschool programs (Lammers & Kleinjan, 2022; World Health Organization, 2012).

Furthermore, as mentioned before, girls' mental health is particularly at risk. Girls are known to co-ruminate (i.e., disclosing and extensively discussing emotional problems in dyadic relationships) with friends more than boys (Smith, 2015) and this co-rumination may contribute to the higher risk for girls. Almquist and colleagues (2014) argued that co-rumination, during which personal problems are often discussed and revisited with a focus on negative feelings (Rose, 2002), may confound the benefits of close peer relationships on subsequent mental health. Thus, while girls are known to experience more intimate and supportive friendships than boys, co-rumination may instill more empathic distress and conflict in these peer relationships (Rose, 2002; Smith, 2015). Future research on the effectiveness of prevention and intervention strategies for mental health should focus on these gender-specific findings (Liu, Xu, Li, Raat & Jiang, 2021).

Finally, societal responses to the COVID-19 pandemic, including social distancing, quarantines, and school closures, have harmed adolescent friendships and mental health (Houghton et al., 2022; Van de Bongardt & Peer Relations Researchers network, 2020). The results of the current dissertation highlight the urgency for policymakers to consider the effects of physical distancing and social isolation during the current COVID-19 pandemic (Rogers et al., 2021) on mental health, as online friendships do not replace high-quality offline friendships. In case of future pandemics or other health-

related disasters (e.g., climate change), it is critical to prioritize adolescent friendships to protect and promote mental health.

Conclusions

The main aim of the research conducted for this dissertation was to better understand potential risk and protective factors associated with adolescents' mental health from a psychosocial perspective, by examining the interplay between individual factors (e.g., gender, global self-esteem) and social relationships (with parents and friends) and their linkages with adolescents' well-being and internalizing problems. In so doing, this dissertation expands on the existing literature about adolescent mental health through 1) a broad conceptualization of mental health encompassing well-being and internalizing problems, 2) distinguishing between the unique roles of mothers and fathers, 3) a focus on adolescent relationships with close friends as most proximal peer relationships, and 4) investigation of differences and similarities between girls and boys. Together, the five empirical studies described in this dissertation indicate that the quality of adolescent boys' and girls' relationships with mothers, fathers, and close friends are associated with well-being and internalizing problems in several ways. Adolescents' friendships were shown to be particularly important, directly for boys and indirectly via global self-esteem for girls. These results support the value of applying a psychosocial perspective to the understanding of adolescents' mental health and provide relevant implications for mental health protection and promotion efforts. As girls appear to be particularly at risk, future research is recommended to study the effectiveness of such efforts to gain insight into what works for whom and why to provide evidence-based gender-tailored programs for boys and girls.

REFERENCES

Allen, J. P., Costello, M., Kansky, J., & Loeb, E. L. (2022). When friendships surpass parental relationships as predictors of long-term outcomes: Adolescent relationship qualities and adult psychosocial functioning. *Child Development*, *93*(3), 760-777. https://doi.org/10.1111/cdev.13713

Almquist, Y. B., Östberg, V., Rostila, M., Edling, C., & Rydgren, J. (2014). Friendship network characteristics and psychological well-being in late adolescence: exploring differences by gender and gender composition. *Scandinavian Journal of Public Health*, *42*(2), 146-154. https://doi.org/10.1177/1403494813510793

Asparouhov, T., Hamaker, E. L., & Muthén, B. (2018). Dynamic structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, *25*(3), 359-388. https://doi.org/10.1080/10705511.2017.1406803

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1-26. https://doi.org/10.1146/annurev.psych.52.1.1

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173

Bartels, M., Cacioppo, J. T., Van Beijsterveldt, T. C., & Boomsma, D. I. (2013). Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetics*, *43*(3), 177-190. https://doi.org/10.1007/s10519-013-9589-7

Begen, F. M., & Turner-Cobb, J. M. (2012). The need to belong and symptoms of acute physical health in early adolescence. *Journal of Health Psychology*, *17*(6), 907-916. https://doi.org/10.1177/1359105311431176

Bevelander, K. E., Smit, C. R., van Woudenberg, T. J., Buijs, L., Burk, W. J., & Buijzen, M. (2018). Youth's social network structures and peer influences: study protocol MyMovez project–Phase I.*BMC Public Health,18*(1), 1-13. https://doi.org/10.1186/s12889-018-5353-5

Beyens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2020). The effect of social media on well-being differs from adolescent to adolescent. *Scientific Reports*, *10*(1), 1-11. https://doi.org/10.1038/s41598-020-67727-7

Boer, M., Stevens, G. W., Finkenauer, C., & van den Eijnden, R. J. (2022). The complex association between social media use intensity and adolescent wellbeing: A longitudinal investigation of five factors that may affect the association. *Computers in Human Behavior*, *128*, 107084. https://doi.org/10.1016/j.chb.2021.107084

Bor, W., Dean, A. J., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal of Psychiatry*, *48*(7), 606-616. https://doi.org/10.1177/0004867414533834

Bos, H. M., Kuyper, L., & Gartrell, N. K. (2018). A population-based comparison of female and male same-sex parent and different-sex parent households. *Family Process*, *57*(1), 148-164. https://doi.org/10.1111/famp.12278

Branje, S. J., Hale, W. W., Frijns, T., & Meeus, W. H. (2010). Longitudinal associations between perceived parent–child relationship quality and depressive symptoms in adolescence. *Journal of Abnormal Child Psychology*, *38*(6), 751-763. https://doi.org/10.1007/s10802-010-9401-6

Brendgen, M., & Vitaro, F. (2008). Peer rejection and physical health problems in early adolescence. *Journal of Developmental & Behavioral Pediatrics*, *29*(3), 183-190. https://doi.org/10.1097/DBP.0b013e318168be15

Buist, K. L., Deković, M., & Prinzie, P. (2013). Sibling relationship quality and psychopathology of children and adolescents: A meta-analysis. *Clinical Psychology Review*, *33*(1), 97-106. https://doi.org/10.1016/j.cpr.2012.10.007

Bullinger, M., Brütt, A. L., Erhart, M., & Ravens-Sieberer, U. (2008). Psychometric properties of the KINDL-R questionnaire: results of the BELLA study. *European Child & Adolescent Psychiatry*, *17*(1), 125-132. https://doi.org/10.1007/s00787-008-1014-z

Burke, T., Sticca, F., & Perren, S. (2017). Everything's gonna be alright! The longitudinal interplay among social support, peer victimization, and depressive symptoms. *Journal of Youth and Adolescence*, *46*(9), 1999-2014. https://doi.org/10.1007/s10964-017-0653-0

Busch, V., de Leeuw, J. R. J., de Harder, A., & Schrijvers, A. J. P. (2013). Changing multiple adolescent health behaviors through school-based interventions: a review of the literature. *Journal of School Health*, *83*(7), 514-523. https://doi.org/10.1111/josh.12060

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, 4th ed., pp. 151-192). Oxford University Press.

Clark, K. N., & Malecki, C. K. (2022). Adolescent mental health profiles through a latent dual-factor approach. *Journal of School Psychology*, *91*, 112-128. https://doi.org/10.1016/j.jsp.2022.01.003

Cortés-García, L., Wichstrøm, L., Viddal, K. R., & Senra, C. (2019). Prospective bidirectional associations between attachment and depressive symptoms from middle childhood to adolescence. *Journal of Youth and Adolescence*, *48*(11), 2099-2113. https://doi.org/10.1007/s10964-019-01081-4

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, *48*(1), 243-267. https://doi.org/10.1146/annurev.psych.48.1.243

De Graaf, H., van den Borne, M., Nikkelen, S., Twisk, D., & Meijer, S. (2017). Seksuele gezondheid van jongeren in Nederland anno 2017. Delft, The Netherlands: Rutgers and Soa Aids Nederland. Retrieved June 6, 2022, from https://seksonderje25e.nl/files/uploads/Onderzoeksboek%20Seks%20onder%20je%2025e%202017.pdf

De Haan, A., Keij, M., & Lammers, J. (2021). Handreiking bevordering mentale gezondheid jeugd. Retrieved July 10, 2022, from https://www.trimbos.nl/docs/f34b56cc-e0f8-437b-9c19-6eb58f61b81c.pdf

De Looze, M. E., Cosma, A. P., Vollebergh, W. A., Duinhof, E. L., de Roos, S. A., van Dorsselaer, S. A. F. M., ... & Stevens, G. W. J. M. (2020). Trends over time in adolescent emotional wellbeing in the Netherlands, 2005-2017: links with perceived schoolwork pressure, parent–adolescent communication and bullying victimization. *Journal of Youth and Adolescence*, *49*(10), 2124-2135. https://doi.org/10.1007/s10964-020-01280-4

Dinizulu, S. M., Grant, K. E., Bryant, F. B., Boustani, M. M., Tyler, D., & McIntosh, J. M. (2014). Parent–Adolescent Relationship Quality and Nondisclosure as Mediators of the Association Between Exposure to Community Violence and Psychological Distress. *Child Youth Care Forum*, *43*, 41-61. https://doi.org/10.1007/s10566-013-9224-z

Dirks, M. A., Persram, R., Recchia, H. E., & Howe, N. (2015). Sibling relationships as sources of risk and resilience in the development and maintenance of internalizing and externalizing

problems during childhood and adolescence. *Clinical Psychology Review*, *42*, 145-155. https://doi.org/10.1016/j.cpr.2015.07.003

Durbeej, N., Sörman, K., Selinus, E. N., Lundström, S., Lichtenstein, P., Hellner, C., & Halldner, L. (2019). Trends in childhood and adolescent internalizing symptoms: results from Swedish population based twin cohorts. *BMC Psychology*, *7*(1), 1-10. https://doi.org/10.1186/s40359-019-0326-8

Eriksson, C., Arnarsson, Á. M., Damsgaard, M. T., Löfstedt, P., Potrebny, T., Suominen, S., Thorsteinsson, E. B., Torsheim, T., Välimaa, R., & Due, P. (2019). Towards enhancing research on adolescent positive mental health. *Nordisk välfärdsforskning| Nordic Welfare Research*, *4*(2), 113-128. https://doi.org/10.18261/issn.2464-4161-2019-02-08

Farineau, H. M., Stevenson Wojciak, A., & McWey, L. M. (2013). You matter to me: important relationships and self-esteem of adolescents in foster care. *Child & Family Social Work*, *18*(2), 129-138. https://doi.org/10.1111/j.1365-2206.2011.00808.x

Flynn, M., & Rudolph, K. D. (2014). A prospective examination of emotional clarity, stress responses, and depressive symptoms during early adolescence. *The Journal of Early Adolescence*,34(7), 923-939. https://doi.org/10.1177/0272431613513959

Gadermann, A. M., Guhn, M., Schonert-Reichl, K. A., Hymel, S., Thomson, K., & Hertzman, C. (2016). A population-based study of children's well-being and health: The relative importance of social relationships, health-related activities, and income. *Journal of Happiness Studies*, *17*(5), 1847-1872. https://doi.org/10.1007/s10902-015-9673-1

Gaertner, A. E., Fite, P. J., & Colder, C. R. (2010). Parenting and friendship quality as predictors of internalizing and externalizing symptoms in early adolescence. *Journal of Child and Family Studies*, *19*(1), 101-108. https://doi-org.eur.idm.oclc.org/10.1007/s10826-009-9289-3

GGD GHOR Nederland. (2022). Middelbare scholieren minder gelukkig dan voor de coronacrisis. Retrieved May 20, 2022, from https://ggdghor.nl/actueel-bericht/middelbare-scholieren-minder-gelukkig-dan-voor-de-coronacrisis/

Ghassabian, A., Suleri, A., Blok, E., Franch, B., Hillegers, M. H., & White, T. (2022). Adolescent gender diversity: sociodemographic correlates and mental health outcomes in the general population. *Journal of Child Psychology and Psychiatry*. https://doi.org/10.1111/jcpp.13588

Gómez-López, M., Viejo, C., & Ortega-Ruiz, R. (2019). Psychological well-being during adolescence: Stability and association with romantic relationships. *Frontiers in Psychology*, *10*, 1772. https://doi.org/10.3389/fpsyg.2019.01772

Griffith, J. M., Young, J. F., & Hankin, B. L. (2021). Longitudinal associations between positive affect and relationship quality among children and adolescents: Examining patterns of co-occurring change. *Emotion*, *21*(1), 28. https://doi.org/10.1037/emo0000682

Hartas, D. (2021). The social context of adolescent mental health and wellbeing: Parents, friends and social media. *Research Papers in Education*, *36*(5), 542-560. https://doi.org/10.1080/02671522.2019.1697734

Henkens, J. H., Kalmijn, M., & de Valk, H. A. (2022). Life Satisfaction Development in the Transition to Adulthood: Differences by Gender and Immigrant Background. *Journal of Youth and Adolescence*, *51*(2), 305-319. https://doi.org/10.1007/s10964-021-01560-7

Iasiello, M., van Agteren, J., Schotanus-Dijkstra, M., Lo, L., Fassnacht, D. B., & Westerhof, G. J. (2022). Assessing mental wellbeing using the Mental Health Continuum—Short Form: A systematic review and meta-analytic structural equation modelling. *Clinical Psychology: Science and Practice*. https://doi.org/10.1037/cps0000074

Karaś, D., Cieciuch, J., & Keyes, C. L. (2014). The polish adaptation of the mental health continuum-short form (MHC-SF). *Personality and Individual Differences*, *69*, 104-109. https://doi.org/10.1016/j.paid.2014.05.011

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Kassebaum, N., Kyu, H. H., Zoeckler, L., Olsen, H. E., Thomas, K., Pinho, C., ... & Meaney, P. A. (2017). Child and adolescent health from 1990 to 2015: findings from the global burden of diseases, injuries, and risk factors 2015 study. *JAMA pediatrics*, *171*(6), 573-592. https://doi.org/10.1001/jamapediatrics.2017.0250

Keizer, R., Helmerhorst, K. O., & Van Rijn-van Gelderen, L. (2019). Perceived quality of the mother–adolescent and father–adolescent attachment relationship and adolescents' self-esteem. *Journal of Youth and Adolescence*, *48*(6), 1203-1217. https://doi.org/10.1007/s10964-019-01007-0

Kelly, Y., Zilanawala, A., Booker, C., & Sacker, A. (2018). Social media use and adolescent mental health: Findings from the UK Millennium Cohort Study. *EClinicalMedicine*, *6*, 59-68. https://doi-org.eur.idm.oclc.org/10.1016/j.eclinm.2018.12.005

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539-548. https://doi.org/10.1037/0022-006X.73.3.539

Kim, J., Thompson, E. A., Walsh, E. M., & Schepp, K. G. (2015). Trajectories of parent–adolescent relationship quality among at-risk youth: Parental depression and adolescent developmental outcomes. *Archives of Psychiatric Nursing*, *29*(6), 434-440. https://doi.org/10.1016/j.apnu.2015.07.001

Kleinjan, M., Pieper, I., Stevens, G. W. J. M., Van de Klundert, N., Rombouts, M., Boer, M., & Lammers, J. (2020). Geluk onder druk?: Onderzoek naar het mentaal welbevinden van jongeren in Nederland. Den Haag. Retrieved May 10, 2022, from https://www.trimbos.nl/wp-content/uploads/sites/31/2021/09/af1785-geluk-onder-druk.pdf

Kochel, K. P., Ladd, G. W., & Rudolph, K. D. (2012). Longitudinal associations among youth depressive symptoms, peer victimization, and low peer acceptance: An interpersonal process perspective. *Child Development*, *83*(2), pp. 637-650. https://doi.org/10.1111/j.1467-8624.2011.01722.x

Lakey, B., & Orehek, E. (2011). Relational regulation theory: a new approach to explain the link between perceived social support and mental health. *Psychological review*, *118*(3), 482-295. https://doi.org/10.1037/a0023477

Lammers, J., & Kleinjan, M. (2022). Help de jeugd aan betere mentale gezondheid. *Kind & Adolescent Praktijk*, *21*, 20-22. https://doi.org/10.1007/s12454-022-0683-y

Laser, J. A., & Nicotera, N. (2021). *Working with adolescents: A guide for practitioners*. Guilford Publications.

Lim, Y. J. (2014). Psychometric characteristics of the Korean Mental Health Continuum–Short Form in an adolescent sample. *Journal of Psychoeducational Assessment*, *32*(4), 356-364. https://doi.org/10.1177/0734282913511431

Liu, Q., Xu, Y., Li, Y., Raat, H., & Jiang, M. (2021). Bidirectional associations between school connectedness and mental health problems in early adolescence: a cross-lagged model. *School Mental Health*, *13*(4), 730-742. https://doi.org/10.1007/s12310-021-09440-y

Maciejewski, D. F., van Lier, P. A., Branje, S. J., Meeus, W. H., & Koot, H. M. (2015). A 5-year longitudinal study on mood variability across adolescence using daily diaries. *Child Development*, *86*(6), 1908-1921. https://doi.org/10.1111/cdev.12420

Magson, N. R., Freeman, J. Y., Rapee, R. M., Richardson, C. E., Oar, E. L., & Fardouly, J. (2021). Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic. *Journal of Youth and Adolescence*, *50*(1), 44-57. https://doi.org/10.1007/s10964-020-01332-9

Mak, H. W., Fosco, G. M., & Lanza, S. T. (2021). Dynamic associations of parent–adolescent closeness and friend support with adolescent depressive symptoms across ages 12–19. *Journal of Research on Adolescence*, *31*(2), 299-316. https://doi.org/10.1111/jora.12597

Marino, C., Gini, G., Angelini, F., Vieno, A., & Spada, M. M. (2020). Social norms and emotions in problematic social media use among adolescents. *Addictive Behaviors Reports*, 100250. https://doi-org.eur.idm.oclc.org/10.1016/j.abrep.2020.100250

Marino, C., Vieno, A., Pastore, M., Albery, I. P., Frings, D., & Spada, M. M. (2016). Modeling the contribution of personality, social identity and social norms to problematic Facebook use in adolescents.*Addictive behaviors*,*63*, 51-56. https://doi.org/10.1016/j.addbeh.2016.07.001

Martin-Storey, A., Dirks, M., Holfeld, B., Dryburgh, N. S., & Craig, W. (2021). Family relationship quality during the COVID-19 pandemic: The value of adolescent perceptions of change. *Journal of Adolescence*, *93*, 190-201. https://doi.org/10.1016/j.adolescence.2021.11.005

McCloughen, A., Foster, K., Huws-Thomas, M., & Delgado, C. (2012). Physical health and wellbeing of emerging and young adults with mental illness: An integrative review of international literature. *International Journal of Mental Health Nursing*, *21*(3), 274-288. https://doi.org/10.1111/j.1447-0349.2011.00796.x

McNeish, D., & Hamaker, E. L. (2020). A primer on two-level dynamic structural equation models for intensive longitudinal data in Mplus. *Psychological Methods*, *25*(5), 610-635. https://doi.org/10.1037/met0000250

Moksnes, U. K., & Reidunsdatter, R. J. (2019). Self-esteem and mental health in adolescents–level and stability during a school year. *Norsk Epidemiologi*, *28*(1-2). https://doi.org/10.5324/nje.v28i1-2.3052

Motmans, J., Burgwal, A., & Dierckx, M. (2020). Adviesnota: het meten van genderidentiteit in kwantitatief onderzoek. Retrieved May 20, 2022, from https://biblio.ugent.be/publication/8663951/file/8663954

Meeus, W. (2016). Adolescent psychosocial development: A review of longitudinal models and research. *Developmental Psychology*, *52*(12), 1969- 1993. https://doi.org/10.1037/dev0000243

Munasinghe, S., Sperandei, S., Freebairn, L., Conroy, E., Jani, H., Marjanovic, S., & Page, A. (2020). The impact of physical distancing policies during the COVID-19 pandemic on health and well-being among Australian adolescents. *Journal of Adolescent Health*, *67*(5), 653-661. https://doi.org/10.1016/j.jadohealth.2020.08.008

Murillo, M., Bel, J., Pérez, J., Corripio, R., Carreras, G., Herrero, X., Mengibar, J., Rodriguez-Arjona, D., Ulrike Ravens-Sieberer, U., Hein Raat, H., & Rajmil, L. (2017). Health-related quality of life (HRQOL) and its associated factors in children with Type 1 Diabetes Mellitus (T1DM). *BMC Pediatrics*, *17*(1), 1-9. https://doi.org/10.1186/s12887-017-0788-x

Nederlands Jeugd Instituut. (2022). Effectieve jeugdinterventies, Retrieved July 10, 2022, from https://www.nji.nl/interventies

Nelemans, S. A., Hale, W. W., Branje, S. J., Hawk, S. T., & Meeus, W. H. (2014). Maternal criticism and adolescent depressive and generalized anxiety disorder symptoms: A 6-year longitudinal community study. *Journal of Abnormal Child Psychology*, *42*(5), 755-766. https://doi.org/10.1007/s10802-013-9817-x

Park, H., & Lee, K. S. (2020). The association of family structure with health behavior, mental health, and perceived academic achievement among adolescents: a 2018 Korean nationally representative survey. *BMC Public Health*, *20*(1), 1-10. https://doi.org/10.1186/s12889-020-08655-z

Parkin, E., Long, R., & Gheera, M. (2019). Children and young people's mental health: policy, services, funding and education (No. 07196). House of Commons Library. Retrieved September 10, 2020 from: https://dera.ioe.ac.uk/30819/1/CBP-7196%20_Redacted.pdf

Petrillo, G., Capone, V., Caso, D., & Keyes, C. L. (2015). The Mental Health Continuum–Short Form (MHC–SF) as a measure of well-being in the Italian context. *Social Indicators Research*, *121*(1), 291-312. https://doi.org/10.1007/s11205-014-0629-3

Potrebny, T., Wiium, N., & Lundegård, M. M. I. (2017). Temporal trends in adolescents' self-reported psychosomatic health complaints from 1980-2016: A systematic review and meta-analysis. *PLoS One*, *12*(11), e0188374. https://doi.org/10.1371/journal.pone.0188374

Pouwels, J. L., Keijsers, L., & Odgers, C. (2022). Who benefits most from using social media, the socially rich or the socially poor?. *Current Opinion in Psychology*, 101351. https://doi.org/10.1016/j.copsyc.2022.101351

Primack, B. A., & Escobar-Viera, C. G. (2017). Social media as it interfaces with psychosocial development and mental illness in transitional age youth. *Child and Adolescent Psychiatric Clinics of North America*, *26*(2), 217-233. https://doi.org/10.1016/j.chc.2016.12.007

Raboteg-Šarić, Z., & Šakić, M. (2014). Relations of parenting styles and friendship quality to self-esteem, life satisfaction and happiness in adolescents. *Applied Research in Quality of Life*, *9*, 749-765. https://doi.org/10.1007/s11482-013-9268-0

Reith-Hall, E. (2019). Child and adolescent mental health: A psychosocial perspective. In M. Payne, & E. Reith-Hall (Eds.), *The Routledge Handbook of Social Work Theory* (pp. 405-413). Routledge. https://doi.org/10.4324/9781315211053

Rijksoverheid. (2022). Kabinet start brede beweging voor betere mentale gezondheid. Retrieved July 10, 2022, from https://www.rijksoverheid.nl/actueel/nieuws/2022/06/10/kabinet-start-brede-beweging-voor-betere-mentale-gezondheid

Rogers, A. A., Ha, T., & Ockey, S. (2021). Adolescents' Perceived Socio-Emotional Impact of COVID-19 and Implications for Mental Health: Results From a US-Based Mixed-Methods Study. *Journal of Adolescent Health*, *68*(1), 43-52. https://doi.org/10.1016/j.jadohealth.2020.09.039

Rose, A. J. (2002). Co–rumination in the friendships of girls and boys. *Child Development*, *73*(6), 1830-1843. https://doi.org/10.1111/1467-8624.00509

Rosenthal, N. L., & Kobak, R. (2010). Assessing adolescents' attachment hierarchies: Differences across developmental periods and associations with individual adaptation. *Journal of Research on Adolescence*, *20*(3), 678-706. https://doi.org/10.1111/j.1532-7795.2010.00655.x

Rudolph, K. D., & Conley, C. S. (2005). The socioemotional costs and benefits of social-evaluative concerns: Do girls care too much?. *Journal of Personality*, *73*(1), 115-138. https://doi.org/10.1111/j.1467-6494.2004.00306.x

Rudolph, K. D., Flynn, M., Abaied, J. L., Groot, A., & Thompson, R. (2009). Why is past depression the best predictor of future depression? Stress generation as a mechanism of depression

continuity in girls. *Journal of Clinical Child & Adolescent Psychology*, *38*(4), 473-485. https://doi.org/10.1080/15374410902976296

Sampasa-Kanyinga, H., & Lewis, R. F. (2015). Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents. *Cyberpsychology, Behavior, and Social Networking*, *18*(7), 380-385. https://doi.org/10.1089/cyber.2015.0055

Schacter, H. L., Lessard, L. M., Kiperman, S., Bakth, F., Ehrhardt, A., & Uganski, J. (2021). Can friendships protect against the health consequences of peer victimization in adolescence? A systematic review. *School Mental Health*, *13*(3), 578-601. https://doi.org/10.1007/s12310-021-09417-x

Schumm, W. R. (2016). A review and critique of research on same-sex parenting and adoption. *Psychological Reports*, *119*(3), 641-760. https://doi.org/10.1177/0033294116665594

Schwartz-Mette, R. A., Shankman, J., Dueweke, A. R., Borowski, S., & Rose, A. J. (2020). Relations of friendship experiences with depressive symptoms and loneliness in childhood and adolescence: A meta-analytic review. *Psychological Bulletin*, *146*(8), 664-700. https://doi.org/10.1037/bul0000239

Singh, K., Bassi, M., Junnarkar, M., & Negri, L. (2015). Mental health and psychosocial functioning in adolescence: An investigation among Indian students from Delhi. *Journal of Adolescence*, *39*, 59-69. https://doi.org/10.1016/j.adolescence.2014.12.008

Smith, R. L. (2015). Adolescents' emotional engagement in friends' problems and joys: Associations of empathetic distress and empathetic joy with friendship quality, depression, and anxiety. *Journal of Adolescence*, *45*, 103-111. https://doi.org/10.1016/j.adolescence.2015.08.020

Steinweg, M., de Lange, A., van de Thillart, C., Looman, B., de Haan, A., & Kleinjan, M. (2021). Preventief werken aan sociaal emotionele ontwikkeling en welbevinden: Een handreiking voor leerkrachten/docenten in het PO en VO. Retrieved July 5, 2022, from: https://dspace.library.uu.nl/bitstream/handle/1874/416996/AF1921_Preventief_werken_aan_sociaal_emotionele_ontwikkeling_en_welbevinden.pdf?sequence=1

Stevens, G. W. J. M., Van Dorsselaer, S., Boer, M., de Roos, S., Duinhof, E. L., ter Bogt, T. F. M., ... & de Looze, M. (2018). HBSC 2017. Gezondheid en welzijn van jongeren in Nederland. Retrieved May 15, 2020, from: https://hbsc-nederland.nl/wp-content/uploads/2018/09/Rapport-HBSC-2017.pdf

Thorisdottir, I. E., Asgeirsdottir, B. B., Sigurvinsdottir, R., Allegrante, J. P., & Sigfusdottir, I. D. (2017). The increase in symptoms of anxiety and depressed mood among Icelandic adolescents: time trend between 2006 and 2016. *The European Journal of Public Health*, *27*(5), 856-861. https://doi.org/10.1093/eurpub/ckx111

Uçar, H. N., Çetin, F. H., Ersoy, S. A., Güler, H. A., Kılınç, K., & Türkoğlu, S. (2020). Risky cyber behaviors in adolescents with depression: A case control study. *Journal of Affective Disorders*, *270*, 51-58. https://doi.org/10.1016/j.jad.2020.03.046

Umberson, D., & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior*, *51*(1_suppl), S54-S66. https://doi.org/10.1177/0022146510383501

Underwood, M. K., & Ehrenreich, S. E. (2017). The power and the pain of adolescents' digital communication: Cyber victimization and the perils of lurking. *American Psychologist*, *72*(2), 144-158. https://doi.org/10.1037/a0040429

Van Dale, D., Shields-Zeeman, L., Schokker, D., Smit, F., Storm, I., van Bon-Martens, M. (2022). Effectieve interventies en beleid mentale gezondheid en preventie. Retrieved June 20,

2022, from https://www.trimbos.nl/wp-content/uploads/2022/04/AF1995-Effectieve-interventies-en-beleid-mentale-gezondheid-en-preventie-1.pdf

Van Bon-Martens, M., Verweij, A., Monshouwer, K., Luijten, C., Tak, N., van den Brink, C., Shields-Zeeman, L., & Storm, I. (2022a). Monitoren mentale gezondheid. Retrieved July 10, 2022, from https://www.trimbos.nl/wp-content/uploads/2022/05/AF2003-Monitoren-mentale-gezondheid.pdf

Van Bon-Martens, M., Kleinjan, M., Hipple Walters, B., Shields-Zeeman, L., & Van den Brink, C. (2022b). Delphistudie 'Definitie Mentale Gezondheid'. Retrieved July 10, 2022, from https://www.trimbos.nl/wp-content/uploads/2022/05/AF1979-Factsheet-Delphistudie-Definitie-mentale-gezondheid.pdf

Van der Laan, S. E., Finkenauer, C., Lenters, V. C., Van Harmelen, A. L., van der Ent, C. K., & Nijhof, S. L. (2021). Gender-Specific Changes in Life Satisfaction After the COVID-19–Related Lockdown in Dutch Adolescents: A Longitudinal Study. *Journal of Adolescent Health*, *69*(5), 737-745. https://doi.org/10.1016/j.jadohealth.2021.07.013

Van Eijck, F. E., Branje, S. J., Hale, W. W., & Meeus, W. H. (2012). Longitudinal associations between perceived parent–adolescent attachment relationship quality and generalized anxiety disorder symptoms in adolescence. *Journal of Abnormal Child Psychology*, *40*(6), 871-883. https://doi.org/10.1007/s10802-012-9613-z

Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review*, *11*(1), 274-302. https://doi.org/10.1111/sipr.12033

Vliek, L., Overbeek, G., & Orobio de Castro, B. (2019). Effects of Topper Training on psychosocial problems, self-esteem, and peer victimisation in Dutch children: A randomised trial. *PloS One*, *14*(11), e0225504. https://doi.org/10.1371/journal.pone.0225504

Von Soest, T., Bakken, A., Pedersen, W., & Sletten, M. A. (2020). Life satisfaction among adolescents before and during the COVID-19 pandemic. *Tidsskrift for Den norske legeforening*. https://doi.org/10.4045/tidsskr.20.0437

Way, N. (2011). *Deep secrets: Boys' friendships and the crisis of connection*. Harvard University Press.

Withers, M. C., McWey, L. M., & Lucier-Greer, M. (2016). Parent–adolescent relationship factors and adolescent outcomes among high-risk families. *Family Relations*, *65*(5), 661-672. https://doi.org/10.1111/fare.12220

World Health Organization. (2012). Adolescent mental health: mapping actions of nongovernmental organizations and other international development organizations. Retrieved May 5, 2022, from https://apps.who.int/iris/bitstream/handle/10665/44875/9789241503648_eng.pdf

World Health Organization. (2013). Mental health action plan 2013-2020. Retrieved June 1, 2020, from https://apps.who.int/iris/bitstream/handle/10665/89966/9789241506021_eng.pdf

Wykes, T., Bell, A., Carr, S., Coldham, T., Gilbody, S., Hotopf, M., ... & Creswell, C. (2021). Shared goals for mental health research: What, why and when for the 2020s. *Journal of Mental Health*, 1-9. https://doi.org/10.1080/09638237.2021.1898552

You, S., Lim, S. A., & Kim, E. K. (2018). Relationships between social support, internal assets, and life satisfaction in Korean adolescents. *Journal of Happiness Studies*, *19*(3), 897–915. https://doi-org.eur.idm.oclc.org/10.1007/s10902-017-9844-3.

Young, J. F. and Mufson, L. (2008). Interpersonal psychotherapy for treatment and prevention of adolescent depression. In: J. R. Z. Abela, B. L. Hankin (Eds.), *Handbook of depression in children and adolescents*. New York: The Guilford Press, pp. 288-306.

Yucel, D., & Yuan, A. S. V. (2016). Parents, siblings, or friends? Exploring life satisfaction among early adolescents. *Applied Research in Quality of Life, 11*(4), 1399-1423. https://doi.org/10.1007/s11482-015-9444-5

Zolopa, C., Burack, J. A., O'Connor, R. M., Corran, C., Lai, J., Bomfim, E., ... & Wendt, D. C. (2022). Changes in youth mental health, psychological wellbeing, and substance use during the COVID-19 pandemic: A rapid review. *Adolescent Research Review*, 1-17. https://doi.org/10.1007/s40894-022-00185-6


A

SUMMARY

Adolescence is a period characterized by significant physical, psychological, and social changes, which potentially place adolescents' mental health at risk. In the past decade, there has been an observed decline in adolescents' well-being and an increase in internalizing problems, which are both important components of mental health. This decline in mental health has worsened even more since the start of the global COVID-19 pandemic. In light of this, adolescent mental health is prioritized in research, clinical and educational practice, and public health policy development. The main aim of the research conducted for this dissertation was to better understand potential risk and protective factors associated with adolescents' mental health from a psychosocial perspective, by examining the interplay between individual factors (e.g., gender, global self-esteem) and social relationships (with parents and friends) in association with well-being and internalizing problems. Five research questions were examined through five empirical studies based on newly collected longitudinal data from self-reported questionnaires completed by a school-based sample of 1,304 Dutch adolescents. The data were collected at two time points, separated by a one-year interval, in classrooms during regular school hours after informed consent was provided by the schools, parents, and adolescents themselves.

1. What are the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF) in the measurement of multidimensional well-being among Dutch adolescents?

The results of the validation study (N = 1,175 adolescents) described in Chapter 2 revealed that the MHC-SF is a valid and reliable instrument in the assessment of well-being in Dutch adolescents. Moreover, the MHC-SF showed the same level of accuracy across gender and age groups. Due to its brevity and cross-contextual utility, we consider the MHC-SF to be highly suitable for scientific and epidemiological monitoring of adolescent mental health, including well-being. Therefore, the MHC-SF was used for the further evaluation of adolescent well-being in this dissertation.

2. How are internalizing problems related concurrently to adolescent boys' and girls' well-being, and to what extent does the quality of adolescents' unique relationships with their mothers and fathers buffer this association?

The findings of the cross-sectional study (N = 1,064 adolescents) described in Chapter 3 indicate that adolescents with more internalizing problems reported significantly lower well-being, regardless of the quality of their relationships with their mothers and fathers. Thus, the quality of adolescent relationships with both mothers and fathers did

not buffer the association between internalizing problems and well-being. However, the quality of mother– and father–adolescent relationships was significantly positively and directly related to well-being in adolescents even in the presence of internalizing problems. In other words, adolescents (both boys and girls) with higher-quality parental relationships reported significantly higher concurrent well-being. Moreover, well-being was more strongly related to the quality of the mother–adolescent relationship than with the father–adolescent relationship indicating that mothers and fathers play unique roles in adolescents' well-being.

3. How are internalizing problems related prospectively to adolescent boys' and girls' well-being, and to what extent are these internalizing problems indirectly related to well-being over-time via the quality of adolescents' unique relationships with their mothers, fathers, and close friends?

The longitudinal study (N = 1,298 adolescents) presented in Chapter 4, assessing a model that included internalizing problems, mother– and father–adolescent relationship quality, and friendship quality, while controlling for baseline well-being level, showed that the quality of parent–adolescent (both mother and father) relationships was not significantly related to adolescents' well-being over time. However, friendship quality was positively significantly related to well-being in boys one year later, even after controlling for baseline well-being. Furthermore, internalizing problems were negatively significantly related to subsequent parent–adolescent (both mother and father) relationship quality and friendship quality. Adolescent boys and girls who reported more internalizing problems also reported lower-quality relationships with mothers, fathers, and close friends over time. Internalizing problems were not indirectly (via the quality of relationships with mothers, father, or close friends) but directly related to subsequent well-being in adolescents.

4. What are the direct and interacting effects of friendship quality and social media use in relation to adolescent boys' and girls' well-being and internalizing problems? To what extent do these effects apply to cross-sectional and longitudinal results?

Based on cross-sectional and longitudinal analyses (N = 1,298 adolescents) described in Chapter 5, adolescents with higher-quality friendships concurrently reported significantly higher well-being and fewer internalizing problems (Chapter 5). While significant for both boys and girls, this negative association between friendship quality and internalizing problems was almost twice as strong for girls than for boys. Friendship quality was also positively linked to subsequent well-being of boys (but not girls)

(Chapters 4, 5, and 6). However, there was no significant link between friendship quality and subsequent internalizing problems (Chapter 5).

Furthermore, adolescent girls (but not boys) who used social media more frequently concurrently reported more internalizing problems and lower well-being. This indicates that more frequent social media use poses concurrent risks for internalizing problems and well-being in girls specifically. There were no significant interactive effects of friendship quality and social media, suggesting that social media use and friendship quality play unique roles in internalizing problems and well-being, with greater strength of associations for friendship quality than social media use.

5. How is friendship quality related to adolescent boys' and girls' well-being over time, and to what extent does global self-esteem explain this longitudinal link?

Based on social cognitive theory, the longitudinal study (N = 1,298 adolescents) presented in Chapter 6 proposed global self-esteem as a mediator underlying the observed longitudinal link between friendship quality and well-being in adolescents. The findings revealed no traditional mediation for girls, as the total effect between friendship quality and well-being was not significant. Rather, a significant indirect effect between friendship quality and well-being via girls' global self-esteem was found, showing that, for girls, higher-quality friendships were associated with higher global self-esteem, which in turn, predicted significantly higher levels of well-being one year later. For boys, there was neither a mediating effect, nor an indirect effect of global self-esteem over time, as global self-esteem was not significantly related to subsequent well-being in boys after controlling for baseline well-being and friendship quality. However, there were significant direct effects of friendship quality: boys with higher-quality friendships reported significantly higher concurrent global self-esteem and higher well-being one year later.

Conclusions

The results of the current dissertation support the value of applying a psychosocial theoretical perspective for a better understanding of mental health in adolescents. The findings also confirmed the importance of addressing both well-being and internalizing problems when considering adolescent mental health. In addition, the quality of adolescent boys' and girls' social relationships (with mothers, fathers, and close friends) was found to be associated with well-being and internalizing problems in several ways, demonstrating particular importance of adolescents' friendships. For boys, higher-quality friendships were directly related to well-being over time. For girls, whose mental health appeared to be particularly at risk, higher-quality friendships

were indirectly related to well-being over time, via their global self-esteem. Overall, this dissertation research contributed to the existing literature about adolescent mental health through 1) conceptualizing mental health to encompass both well-being and internalizing problems, 2) distinguishing between the unique roles of mother– and father–adolescent relationships, 3) studying adolescents' relationships with close friends, and 4) assessing differences and similarities between girls and boys in these findings. The findings provide relevant implications for evidence-based mental health protection and promotion efforts (e.g., a holistic and gender-tailored approach, including a focus on friendships). It is recommended that future research examines the effectiveness of such efforts to gain insight into which methods work best for different individual adolescents.

SAMENVATTING

De adolescentie wordt gekenmerkt door aanzienlijke fysieke, psychologische en sociale veranderingen. Hoewel deze veranderingen horen bij deze ontwikkelingsfase, kunnen ze risico's voor de mentale gezondheid van adolescenten met zich meebrengen. In de afgelopen tien jaar is er een afname van het welzijn en een toename van internaliserende problemen (angst, depressie) gesignaleerd, beide belangrijke componenten van mentale gezondheid. Sinds het begin van de COVID-19 pandemie wordt een nog sterkere verslechtering van adolescenten hun mentale gezondheid gezien. De belangrijkste doelstelling van dit proefschrift was om potentiële risico- en beschermende factoren voor de mentale gezondheid van adolescenten beter te begrijpen vanuit een psychosociaal perspectief, door de wisselwerking tussen individuele factoren (zoals geslacht en globale zelfwaardering) en sociale relaties (met ouders en vrienden) op welzijn en internaliserende problemen te bestuderen. Vijf onderzoeksvragen werden onderzocht in vijf empirische studies gepresenteerd in hoofdstuk 2 tot en met hoofdstuk 6. Deze studies waren gebaseerd op gegevens uit zelfrapportage vragenlijsten ingevuld door 1304 Nederlandse adolescenten in de leeftijd van 11 tot en met 17 jaar. De vragenlijsten werden op twee tijdstippen ingevuld, namelijk in de lente van 2018 en de lente van 2019. De adolescenten vulden de vragenlijsten in de klas in tijdens de reguliere schooluren nadat toestemming was gegeven door de scholen, de adolescenten en hun ouders.

1. Wat zijn de psychometrische aspecten van de Mental Health Continuum-Short Form (MHC-SF) bij het meten van multidimensionaal welzijn bij Nederlandse adolescenten?
In hoofdstuk 2 zijn de resultaten van de validatiestudie (N = 1175) beschreven. Dit hoofdstuk laat zien dat de MHC-SF een valide en betrouwbaar instrument is voor het meten van welzijn bij Nederlandse adolescenten. Bovendien bleek dat MHC-SF welzijn met dezelfde nauwkeurigheid meet bij jongens, meisjes en de bestudeerde leeftijdsgroepen. De MHC-SF is beknopt en bruikbaar in verschillende landen en contexten. Dit maakt het instrument zeer geschikt voor wetenschappelijke en epidemiologische monitoring van multidimensionaal welzijn van adolescenten. Zodoende is de MHC-SF gebruikt voor het meten van welzijn binnen dit proefschrift.

2. Hoe hangen internaliserende problemen samen met het welzijn van adolescente jongens en meisjes, en in hoeverre vormt de kwaliteit van de unieke relaties van adolescenten met hun moeders en vaders een buffer voor deze associatie?
De cross-sectionele studie (N =1064) beschreven in hoofdstuk 3 laat zien dat de kwaliteit van adolescenten hun relaties met zowel moeders als vaders geen buffer was binnen de associatie tussen internaliserende problemen en welzijn. Dus meer

internaliserende problemen hingen samen met een lager welzijn voor adolescenten, ongeacht of zij hogere of lagere kwaliteit relaties hadden met hun moeders of vaders. Hogere kwaliteit relaties met beide ouders hingen echter wel samen met een hoger welzijn van adolescenten, zelfs in de aanwezigheid van internaliserende problemen. Met andere woorden, adolescenten (zowel jongens als meisjes) met hogere kwaliteit relaties met ouders rapporteerden tegelijkertijd ook hoger welzijn. Bovendien bleek welzijn sterker gerelateerd te zijn aan de kwaliteit van de moeder-adolescent relatie dan aan de vader-adolescent relatie.

3. Hoe hangen internaliserende problemen over tijd samen met welzijn van adolescente jongens en meisjes, en in welke mate zijn deze internaliserende problemen indirect gerelateerd aan welzijn over tijd via de kwaliteit van de unieke relaties van adolescenten met hun moeders, vaders, en beste vrienden?

De longitudinale studie (*N* = 1298) gepresenteerd in hoofdstuk 4 is gebaseerd op een model inclusief internaliserende problemen, de kwaliteit van adolescenten hun relaties met moeders, vaders en beste vrienden en gecontroleerd voor welzijn tijdens de nulmeting. Volgens de bevindingen hing de kwaliteit van de relaties met moeders en vaders op T1 niet significant samen met het welzijn van adolescenten op T2. De kwaliteit van vriendschappen was daarentegen wel significant positief gerelateerd aan welzijn over tijd bij adolescenten, zelfs nadat er werd gecontroleerd voor welzijn tijdens de nulmeting. Daarnaast laat de studie zien dat internaliserende problemen op T1 negatief gerelateerd waren aan de kwaliteit van de ouder-adolescent relatie en aan de kwaliteit van vriendschappen op T2. Met andere woorden rapporteerden adolescente jongens en meisjes met meer internaliserende problemen over tijd lagere kwaliteit relaties met moeders, vaders en beste vrienden. Internaliserende problemen waren direct gerelateerd aan het welzijn van adolescenten (ongeacht de kwaliteit van relaties).

4. Wat zijn de directe en interacterende effecten van de kwaliteit van vriendschappen en het gebruik van sociale media in relatie tot welzijn en internaliserende problemen van adolescente jongens en meisjes? In hoeverre zijn deze effecten van toepassing op cross-sectionele en longitudinale resultaten?

Op basis van cross-sectionele en longitudinale analyses (*N* = 1298) beschreven in hoofdstuk 5 rapporteerden adolescenten met hogere kwaliteit van vriendschappen ook een hoger welzijn en minder internaliserende problemen. Ook al was de negatieve associatie tussen de kwaliteit van vriendschappen en internaliserende problemen significant voor zowel jongens als meisjes, het was voor meisjes bijna twee keer zo sterk in vergelijking met jongens. Verder hing de kwaliteit van vriendschappen op T1 positief samen met welzijn op T2 bij jongens maar niet bij meisjes (zie hoofdstukken 4,

5 en 6). Er was echter geen significant verband tussen de kwaliteit van vriendschap en internaliserende problemen over tijd (hoofdstuk 5).

Adolescente meisjes (maar geen jongens) met een frequenter gebruik van sociale media rapporteerden ook meer internaliserende problemen en lager welzijn. Dit geeft aan dat frequenter gebruik van sociale media mogelijk risico's met zich meebrengt voor internaliserende problemen en welzijn bij meisjes. Er waren geen interactieve effecten van de kwaliteit van vriendschappen en de frequentie van sociale media gebruik, wat suggereert dat gebruik van sociale media en de kwaliteit van vriendschappen ieder een unieke rol spelen bij internaliserende problemen en welzijn, met een sterkere associatie voor de kwaliteit van vriendschappen dan voor het gebruik van sociale media.

5. Hoe hangt vriendschapskwaliteit over tijd samen met welzijn van adolescente jongens en meisjes, en in hoeverre verklaart globale zelfwaardering dit longitudinale verband?

In hoofdstuk 6 wordt door middel van een longitudinale studie (N = 1298), gebaseerd op de sociaalcognitieve theorie, globale zelfwaardering beschreven als een mediator die ten grondslag ligt aan het longitudinale verband tussen de kwaliteit van adolescenten hun vriendschappen en hun welzijn. De bevindingen lieten geen mediatie in traditionele zin voor meisjes zien, aangezien het totale effect tussen kwaliteit van vriendschappen en welzijn van meisjes niet significant was. Er werd wel een significant indirect effect gevonden tussen kwaliteit van meisjes hun relaties met beste vrienden en welzijn via hun globale zelfwaardering. Dat wil zeggen, vriendschappen van hogere kwaliteit voorspelden hogere globale zelfwaardering, wat op zijn beurt een jaar later een hoger niveau van welzijn bij meisjes voorspelde. Voor jongens was er over tijd geen mediatie of indirect effect via globale zelfwaardering zichtbaar. Er waren echter wel significante directe effecten van de kwaliteit van vriendschappen; jongens met vriendschappen van hogere kwaliteit rapporteerden gelijktijdig hogere globale zelfwaardering en over tijd hoger welzijn. Nadat er gecontroleerd was voor welzijn tijdens de nulmeting en kwaliteit van vriendschappen, hing globale zelfwaardering niet significant samen met welzijn over tijd bij jongens, wat wijst op een grotere rol van kwaliteit van vriendschappen in welzijn.

Conclusie

Dit proefschrift laat zien dat benaderen van mentale gezondheid vanuit een psychosociaal theoretisch perspectief bijdraagt aan een beter begrip van de potentiële risico- en beschermende factoren van de mentale gezondheid van adolescenten. De bevindingen bevestigden het belang van het bekijken van zowel multidimensionaal welzijn als internaliserende problemen (angst, depressie) bij het bestuderen van

mentale gezondheid van adolescenten. Bovendien bleek de kwaliteit van de relaties van adolescente jongens en meisjes met moeders, vaders en beste vrienden op verschillende manieren geassocieerd te zijn met welzijn en internaliserende problemen. Met name de kwaliteit van vriendschappen had een belangrijke en unieke invloed op welzijn en internaliserende problemen van adolescenten. Zo hingen voor jongens vriendschappen van hogere kwaliteit op T1 direct samen met welzijn op T2, terwijl voor meisjes vriendschappen van hogere kwaliteit op T1 indirect samenhingen met welzijn op T2, namelijk via globale zelfwaardering op T1. Verder bleken meisjes lager te scoren op mentale gezondheid en ook meer risico te lopen op een slechtere mentale gezondheid dan jongens, bijvoorbeeld door het gebruik van social media. Samengevat breidt dit onderzoek de bestaande literatuur uit op drie manieren. Ten eerste wordt mentale gezondheid in dit proefschrift omschreven als welzijn en internaliserende problemen. Ten tweede worden de unieke rollen van de meest proximale relaties van adolescenten onderscheiden, namelijk met moeders, vaders en beste vrienden, in relatie tot welzijn en internaliserende problemen. Ten derde werden de verschillen en overeenkomsten tussen meisjes en jongens in de bevindingen van dit proefschrift belicht. De resultaten bieden relevante implicaties voor de bescherming en promotie van mentale gezondheid, bijvoorbeeld om mentale gezondheid te verbeteren vanuit een holistische benadering waarin vriendschappen worden betrokken. Het wordt aanbevolen dat toekomstig onderzoek de effectiviteit van dergelijke benaderingen onderzoekt om inzicht te krijgen in welke methoden het beste werken in het beschermen en promoten van mentale gezondheid voor verschillende individuele adolescenten en om evidence-based genderspecifieke programma's te bieden.

DANKWOORD

Vijf jaar geleden begon mijn avontuur als PhD-student. Dat klinkt misschien lang, maar wat is de tijd snel gegaan. Ik heb veel mogen leren, ervaren en ontwikkelen, interessante mensen kunnen ontmoeten en mooie samenwerkingen kunnen aangaan. Met veel plezier heb ik mijn data verzameld en geanalyseerd, ideeën uitgewerkt tot artikelen, resultaten gepresenteerd op internationale congressen, cursussen en workshops gevolgd, lesgegeven en scripties begeleid. Ik wil graag iedereen bedanken die, op welke manier dan ook, betrokken is geweest bij het tot stand komen van mijn proefschrift.

Om te beginnen wil ik mijn grote dank uitspreken naar mijn promotieteam, Anna en Daphne, voor alle toegewijde begeleiding die ik heb gekregen. Mijn promotietraject verliep wat anders dan anders, maar jullie hebben mij daarin gesteund en aangemoedigd en mij tegelijkertijd weten uit te dagen in mijn ontwikkeling als wetenschapper en als persoon. Anna, wat een voorrecht dat jij mijn promotor bent geweest en eigenlijk nog veel meer dan dat. Je toegankelijkheid en betrokkenheid zijn verre van vanzelfsprekend en ik heb veel geleerd van je deskundigheid, ervaring en pragmatische maar kritische blik. Als ik vastliep of ergens mee worstelde, wist jij me altijd te helpen met het vinden van een oplossing. Daarnaast wil ik je graag bedanken voor de gezellige gesprekken over niet-inhoudelijke onderwerpen, de kansen die je me hebt gegeven en de momenten dat ik altijd bij je terecht kon. Daphne, wat ben ik blij dat wij elkaar weer op de EUR zijn tegengekomen. Als RESMA-student op de UvA wist ik al hoe leuk het is om met jou samen te werken en hoe veel ik van jouw expertise en passie als wetenschapper kan leren. Zowel inhoudelijk als voor mijn eigen ontwikkeling heb ik veel gehad aan onze gesprekken en jouw feedback op de grote lijnen en op detailniveau. Je hebt me gestimuleerd om te vertrouwen in mijn eigen kunnen en krachten en ik wil je daar heel hartelijk voor bedanken. Ik dank jullie beiden voor het vertrouwen dat jullie in mij hebben gehad om dit project tot een goed einde te brengen, en de ruimte om mijn visie daarin als jonge wetenschapper te ontwikkelen. Ik heb met veel plezier met jullie samengewerkt en hoop dat in de toekomst nog vaak te mogen ervaren.

Ik wil graag alle SMW-collega's bedanken voor de fijne tijd, gezellige lunches, leerzame journal clubs en leuke uitjes. Dankzij jullie voelde ik me altijd thuis bij SMW. In het bijzonder wil ik graag Sanne en Warsha bedanken. Ik had me geen betere kamergenoten kunnen wensen. Sanne, vanaf dag 1 zat jij tegenover me en hebben we de meest uiteenlopende gesprekken gehad. We begonnen als collega's, maar dat werd al gauw een vriendschap. Ik ben je erg dankbaar voor je openheid, eerlijkheid en steun op professioneel en persoonlijk vlak. Ik ben heel blij dat jij naast me wilt staan als paranimf en ik had het allemaal niet zonder jou willen doen. Warsha, toen jij bij ons op de kamer

kwam, was het compleet. We hebben kamer J6.63 omgetoverd tot het gezelligste kantoor met onze Hindoestaanse touch en dat is iets wat ik zeker ga missen. Dankjewel voor jouw warme karakter, de fijne gesprekken en gezellige tijden. Ik hoop dat we die nog vaak gaan hebben.

Dan wil ik graag mijn student- en onderzoeksassistenten bedanken die hebben bijgedragen aan de uitvoer van mijn project. Rachita, vanaf het begin heb jij me geholpen met het werven van de scholen. Wat was dat een (soms ondankbare) klus. Jouw harde werk is mij niet onopgemerkt gebleven en ik ben je erg dankbaar voor al je hulp. Sadhana, onze treinritten tijdens de dataverzamelingen zullen me altijd bijblijven en ik waardeer je inzet en steun tijdens die perioden enorm. Samen met Sushma en Soumia hebben jullie mij tijdens twee ronden dataverzameling geholpen en ik dank jullie voor jullie zelfstandigheid en enthousiasme om er zulke leuke tijden van te maken. Ook wil ik graag Mijke, Sosan, Busra, Imane, Soukaina, Sascha, Isis, Heleen, Eva, Nora, Jamie, Ashvita, Kezia, Kaoutar, Demi, Cindy en Zeki bedanken voor jullie zeer gewaardeerde hulp tijdens de dataverzamelingen. Met een aantal van jullie heb ik maar kort kunnen samenwerken, omdat onverwachts Corona om de hoek kwam kijken en we de derde ronde dataverzameling moesten annuleren. Ik wil jullie bedanken voor jullie toewijding en begrip in die gekke periode.

Mijn grote dank gaat ook zeker uit naar alle deelnemers: de scholen, de ouders en natuurlijk de jongeren. Zonder jullie hadden we dit onderzoek niet kunnen uitvoeren. Dankzij jullie bijdragen en deelnamen zijn we veel te weten gekomen over de mentale gezondheid van jongeren in Nederland en de rol van sociale relaties daarin. Wij kunnen jullie hier niet genoeg voor bedanken.

Dan wil ik mijn coauteurs, Sofie en Joran, bedanken. Ik heb veel van jullie geleerd en met plezier samengewerkt aan mooie studies. Joran, bedankt dat je mij - naast jouw rol als coauteur - ook veel hebt geleerd over de methoden om een onderzoeksvraag te kunnen beantwoorden. Ik kon altijd bij je terecht met vragen wanneer ik even kwijt was hoe het nou ook alweer precies zat.

De commissieleden wil ik graag bedanken voor het lezen en beoordelen van mijn proefschrift en het opponeren tijdens de verdediging.

Uiteraard mag ik ook mijn lieve vriendinnen Lisa en Yvonne niet vergeten. Lisa, wat ben ik blij dat jij als paranimf naast me wilt staan. Als RESMA-studenten hebben we vaak gefantaseerd over het promoveren en gelukkig vonden we allebei een plekje in Rotterdam. De treinritten heen en weer, de theetjes op het station tijdens de

wintermaanden en onze twijfels om toch maar de fiets of tram te pakken zullen me altijd bijblijven. Ik wil je bedanken voor onze vriendschap, jouw gezelligheid en alle steun en hulp als ik weer even vastliep in R. Elke error heb ik met jou weten op te lossen. Ik bof met jou als vriendin en zal je ondersteunen waar ik kan bij het afronden van jouw proefschrift.

Yvonne, wij kennen elkaar al meer dan de helft van ons leven. Ik ben ontzettend dankbaar voor onze vriendschap. Wij hebben lief en leed gedeeld, al sinds de prullenbakwalkjes op Hageveld, maar zeker ook in onze promotietrajecten. De tegenslagen zijn ons niet onbekend, maar wat fijn dat ik mijn verhaal altijd bij jou kwijt kan. Ook al zijn we een halve wereld uit elkaar, we weten elkaar altijd te vinden. Ik heb alle vertrouwen in jou en jouw promotietraject en weet zeker dat je straks als dr. Kuiper terug naar Nederland komt. Ik kan niet wachten!

Lieve mama, papa en Reena, ik heb zoveel aan jullie te danken. Jullie staan altijd voor me klaar en hebben zo met mij meegeleefd. Jullie kwamen met mij proosten op de successen en hielpen me op (en uit) de lastige momenten. Mama, je hebt mij onvoorwaardelijk gesteund, moed ingesproken en aangehoord als ik het even niet zag zitten. Papa, je hebt me altijd aangemoedigd, hebt meegelezen als ik je hulp kon gebruiken en stond klaar om me af te leiden of op te vrolijken als ik dat nodig had. Reena, jij begrijpt mij als geen ander, bood me altijd een luisterend oor en hielp me relativeren en groeien als persoon. Jullie waren en zijn mijn steun en toeverlaat en ik had dit niet zonder jullie gekund. Ook wil ik graag mijn zwager Björn en lieve schoonfamilie bedanken voor alle liefde en steun. Ik ben ontzettend dankbaar dat jullie mijn familie zijn. Bij elke publicatie wisten jullie mij te verrassen met mooie bloemen en jullie betrokkenheid en attente vragen naar hoe het gaat waren me heel waardevol.

Last but definitely not least wil ik graag mijn lieve man bedanken, Viney. Ik kan niet vaak genoeg benadrukken hoe blij ik ben met jou. We hebben samen te horen gekregen dat ik als PhD-student mocht beginnen op de EUR en je bent sindsdien elke stap aan mijn zijde geweest. Je bracht me naar kantoor en haalde me weer op, kwam een warm kopje thee brengen als ik 's avonds nog even doorging, juichte bij mijn hoogtepunten en stimuleerde me om door te gaan als het even tegenzat. Ik had dit niet gekund zonder jouw begrip, geduld, aanmoediging en waardering. Zij aan zij (letterlijk sinds we thuiswerken) hebben we samen aan onze ontwikkeling en doelen gewerkt en ik ben trots op ons. Ik houd van jou.

CURRICULUM VITAE

Department	Socio-Medical Sciences, Erasmus School of Health Policy & Management
PhD period	2017-2022
Promotors	Prof. dr. Anna Petra Nieboer (ESHPM) Dr. Daphne van de Bongardt (ESSB)

Presentations

Poster presentation at the Society for Research on Adolescence (SRA) Biennial meeting: "Understanding the relation between friendship quality and well-being of adolescents: The explanatory role of self-esteem", New Orleans (USA)	2022
Oral presentation and chair at the International Association Relationship Research (IARR): "Adolescents' internalizing problems and well-being: The buffering role of relationships between mothers, fathers, sons, and daughters" (Virtual)	2021
Poster presentation at the Society for Research in Child Development (SRCD) Biennial meeting: "Longitudinal associations among adolescents' internalizing problems, well-being, and the quality of their relationships with their mothers, fathers, and close friends" (Virtual)	2021
Oral presentation at the Society for Research in Child Development (SRCD) Biennial meeting: "The role of social media use and friendship quality in adolescents' internalizing problems and well-being" (Virtual)	2021
Poster presentation at the Society for Research on Adolescence (SRA) Biennial meeting: "Associations between adolescents' internalizing problems and well-being: Is there a buffering role of relationships between mothers, fathers, sons, and daughters?" (Virtual)	2021
Poster presentation at the Society for Research on Adolescence (SRA) Biennial meeting: "Evaluating the Psychometric Properties of the Mental Health Continuum-Short Form (MHC-SF) in Dutch Adolescents" (Virtual)	2021
Presentation at the Peer Relations Onderzoekers (PRO) meeting: "Adolescents' internalizing problems and well-being: The role of social media use and friendship quality" (Virtual)	2021
Poster presentation at the European Association for Research on Adolescence conference: "Internalizing Problems and Adolescent Well-being: The Buffering Role of Relationships Between Mothers, Fathers, Sons and Daughters" (Virtual)	2020

Oral presentation at the Epidemiology and Social Psychiatry conference of the European Psychiatry Association (EPA): "Health professionals' implementation processes and experiences of Brain Blocks", Vienna (Austria)	2018

Courses

Making an academic poster that stands out	2021
Communicating your research: lessons from Bitescience	2020
Searching and managing your literature	2020
Risbo Basis Kwalificatie Onderwijs	2019
Professionalism and integrity in research	2018
Mutlilevel Modeling II	2018
Mutlilevel Modeling I	2018
Data Analysis With R	2018
English Academic Writing	2018
Basic Didactics	2018
Brush Up Your Research Design	2017

Teaching activities

Bachelor Health Policy & Management

Minor Public Health – Co-coordinator	2021
Minor Public Health – Lecturer	2018-2022
Thesis supervisor	2020-2021
Zorg & Welzijn – Headteacher	2019-2022
Zorgen voor later – Supervised work	2019-2022
Zorgen voor later – Practical sessions	2019-2022
Methoden & Technieken 4 – Supervised work	2017-2018
Methoden & Technieken 4 – Practical sessions	2017-2018

Master Healthcare Management

Patient Centered Care Delivery – Supervisor Practical Days	2017-2018

International publications

Luijten, C. C., Van de Bongardt, D., & Nieboer, A. P. (2022). The roles of social media use and friendship quality in adolescents' internalizing problems and well-being. *Journal of Happiness Studies, 23*, 3161-3178. https://doi.org/10.1007/s10902-022-00539-w

Luijten, C. C., Van de Bongardt, D., Jongerling, J., & Nieboer, A. P. (2021). Longitudinal associations among adolescents' internalizing problems, well-being, and the quality

of their relationships with their mothers, fathers, and close friends. *Social Science & Medicine*, *289*, 114387. https://doi.org/10.1016/j.socscimed.2021.114387

Luijten, C. C., Van de Bongardt, D., Jongerling, J., & Nieboer, A. P. (2021). Associations between adolescents' internalizing problems and well-being: Is there a buffering role of boys' and girls' relationships with their mothers and fathers?. *BMC Public Health*, *21*(1), 1871. https://doi.org/10.1186/s12889-021-11920-4

Luijten, C. C., Kuppens, S., Van de Bongardt, D., & Nieboer, A. P. (2019). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Dutch adolescents. *Health and Quality of Life Outcomes*, *17*(1), 157. https://doi.org/10.1186/s12955-019-1221-y

Dutch publications

Van Bon-Martens, M., Verweij, A., Monshouwer, K., Luijten, C., Tak, N., van den Brink, C., Shields-Zeeman, L., & Storm, I. (2022a). Monitoren mentale gezondheid. Retrieved July 10, 2022, from https://www.trimbos.nl/wp-content/uploads/2022/05/AF2003-Monitoren-mentale-gezondheid.pdf

Van de Bongardt, D., & Peer Relations Researchers Network. (2020). Longread: Hoe gaat het met de peers? Over adolescenten en hun relaties met leeftijdgenoten in tijden van COVID-19. *Pedagogiek in Praktijk*, 116, 36-41. http://hdl.handle.net/1765/131135

Peer-reviewer

Journal of Happiness Studies (1)	2022
Child Indicators Research (1)	2019-2020

Additional activities

Chair at the International Association Relationship Research (IARR)	2021
Member of the Peer Relations Researchers Rotterdam (PRR-EUR)	2019-2021
Student member of the European Association for Research on Adolescence (EARA)	2019-2021
Workshop Increase your research visibility to benefit your funding career now and in the future	2021
Webinar Mental health and well-being of adolescents around the world during COVID-19	2020
EADP-EARA-SRA Summer School, Kalamata (Greece)	2019
Workshop Author Identifiers - Why and how?, Rotterdam (The Netherlands)	2017

ABOUT THE AUTHOR

Chantal Luijten, more often known by her nickname Chantie, was born in Amsterdam on the 12th of February in 1993. She studied Health and Life Sciences (with a specialization in Health Sciences and minor in Medicine) at the VU University Amsterdam while completing the Honours Program of the university. She continued her education with the master Management, Policy-Analysis and Entrepreneurship in Health and Life Sciences (with a specialization in Policy) at the VU University Amsterdam and the Research Master Child Development and Education at the University of Amsterdam of which Chantie obtained both master degrees (cum laude) in 2017. After graduation, Chantie started as a PhD candidate at the Erasmus School of Health Policy and Management, department Socio-Medical Sciences (Erasmus University Rotterdam). To the better understand potential risk and protective factors associated with adolescents' mental health from a psychosocial perspective, Chantie studied the interplay between individual factors and social relationships (with parents and friends) and their linkages with adolescents' well-being and internalizing problems. The results of her research were presented at national and international conferences and were published in international peer-reviewed journals. In addition, Chantie taught various courses, such as 'Zorgen voor Later' and 'Zorg en Welzijn', and supervised bachelor theses. Chantie continues to work as an assistant professor for one day a week at the Erasmus School of Health Policy and Management. In addition, she works as a researcher on various projects at GGD GHOR Nederland.

Chantie Luijten, chantieluijten@live.nl