Adolescents' mental health during the COVID-19 pandemic: Do loneliness, family, and online friends matter?

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ABSTRACT

The COVID-19 pandemic has impacted every element of adolescent life worldwide, including Indonesia. This study intended to examine how adolescents' loneliness and mental health during the COVID-19 pandemic are affected by their family relationships and online friendships. This study collects data using an online questionnaire. The Mental Health Continuum-Short Form, the UCLA Loneliness Scale Version 3, the Brief Family Relationship Scale, and the Online Friendship Scale were used to collect the data. Two hundred ninety-two students aged 12-18 participated in data gathering in Jakarta, Indonesia, between March and April 2021. Descriptive, correlation and Structural Equation Modeling (SEM) analyses were conducted using SPSS 25.0 and LISREL 8.80. This research revealed that family relationships and online friendships had a negative effect on loneliness. Family relationships favorably impact adolescent mental health, but loneliness negatively impacts it. Furthermore, family relationships and online friendships indirectly affect adolescents' mental health through loneliness. These findings may implement in developing interventions to assist adolescent mental health during the COVID-19 pandemic in Indonesia.

Introduction

COVID-19 officially became a global pandemic in March 2020 and, a year later, infected millions of people around the world. School and economic shutdowns, until recreation and tourism activities are restricted, have impacted the psychosocial environment of countries worldwide. The lockdown policy to prevent the spread of COVID-19 was implemented. Although it is only recommended to maintain physical distance, it cannot be denied that every person is at risk of social distance due to the drastic reduction of face-to-face meetings. The current crisis significantly affects every individual's daily life (Kowal et al., 2020).

A similar condition occurs in Indonesia. Since the government reported the first case of COVID-19 in Indonesia in March 2020, every sector of society has changed drastically. Along with a physical distancing policy, the Ministry of Education and Culture in Indonesia requires that learning activities be carried out online or remotely from home, affecting adolescents' social aspects due to the limited social activities and direct friendships. This condition contrasts with the adolescent instinct to constantly relate and socialize with others (B. B. Brown et al., 1986). All the conditions might bring significant change and challenges in adolescents' lives (Fong & Iarocci, 2021). As the coronavirus attacks the human respiratory system, physical health is the most affected by the COVID-19 pandemic (Yuki

et al., 2020). However, this pandemic has also greatly affected mental health apart from physical health (Mental Health Foundation, 2020). Accordingly, close attention to adolescents' loneliness and mental health is also needed.

Adolescents are the most vulnerable age group to receive the negative impact of the COVID-19 pandemic related to loneliness and mental health, compared to children or adults age, considering the main tasks of adolescent development are achieved through social interaction with other people (Cooper et al., 2021). Previous studies reveal that the COVID-19 pandemic is challenging for adolescents' loneliness (F. Chen et al., 2020; Ellis et al., 2020; Wang et al., 2020) and mental health (Rossi et al., 2020; Wang et al., 2020). A pandemic is more than just a medical phenomenon; it affects every aspect of society and causes anxiety, stress, and disorder in every individual (Javed et al., 2020). Adolescents staying at home, away from their school and peers, can experience social isolation and lack of social contacts, leading to loneliness (Loades et al., 2020) that can have short or long-term consequences on mental health (Javed et al., 2020).

Loneliness is a perception of being alone and isolated; this definition indicates that loneliness is not just a physical separation from other people (Tiwari, 2013). Loneliness is a painful experience associated with a mismatch between the existing social relationships and the desired one, often described as a state without friends (Myers, 2010). A survey of 1,043 respondents found that loneliness among respondents increased by 181% (almost three times) during the pandemic with the existence of physical distancing and self-quarantine policies (Huff, 2020). Not much different, another survey results stated that since the lockdown period, adolescents are almost three times more likely to experience loneliness, which makes them the most vulnerable age group to experience loneliness (Mental Health Foundation, 2020). While 87% of 2,036 teens and youth ages 13 to 25 experienced loneliness and felt isolated, even though they could still communicate with their friends (YoungMinds, 2020).

When people reach their full potential, work efficiently, manage everyday challenges, and contribute to their communities, they are in good mental health (World Health Organization, 2004). Mental health affects how people think, feel, and behave and includes social, emotional, and psychological well-being (Keyes, 2002). Happiness and satisfaction are states of emotional well-being; social acceptance and support from the community are examples of social well-being, and positive attitudes toward individual differences and becoming independent are examples of psychological well-being (Keyes, 2006). In a recent study conducted in India that children and teenagers aged nine to 18 had felt powerless (66.11%), worried (68.59%), and afraid (61.98%) during this pandemic (Saurabh & Ranjan, 2020). Moreover, in Indonesia during the COVID-19 pandemic, of the 113 adolescents examined, 38.1% were at risk for peer interaction issues, 28.3% for pro-social behavior issues, and 10.6% for emotional issues (Wiguna et al., 2020).

Most studies concentrate on risk factors, but protective factors are also needed and may be more effective as prevention efforts. Feelings of separation from social relationships cause loneliness (de Jong-Gierveld, 1987; Shiovitz-Ezra & Leitsch, 2010). However, teenagers' perceptions of social support from others may operate as a protective factor for their mental health (Fuligni, 2019). Therefore, developing quality social ties might be the best way to achieve good mental health and avoid loneliness. Therefore, adolescents' loneliness and mental health will be impacted by the quality of their family's relationships, both positive and negative. Positive family relationships provide warmth and support from family members, which significantly lowers the risk of loneliness in people of all ages (Hombrados-Mendieta et al., 2013; Stocker et al., 2020) and impact better mental health in adolescents (P. Chen & Harris, 2019; M. D. Johnson & Galambos, 2014).

The development of adolescence is also dominantly influenced by adolescent interactions with peers. Even in a pandemic, adolescents can still build friendships without meeting face to face by utilizing internet technology through online friendship (Antheunis

et al., 2012). Online friendship is a type of friendship that occurs in online situations, with the use of online media, including social networks and internet applications. Online friendships can occur in two types of pairs of friends (Helmi et al., 2017). First, friendships between strangers who meet on social media, then become online friends. Second, friendships between friends or relatives who are known or have actually met (offline) and then interact online. Adolescents are the biggest social media users to connect with friends (Cauberghe et al., 2021). By establishing communication with online friends, adolescents can build desirable interpersonal relationships, reduce the loneliness they experience, and increase their social capital (Best et al., 2014; Triwidodo & Dewi, 2012).

Adolescence is a crucial period in the life cycle of every individual. Therefore, experiencing loneliness and poor mental health, which can adversely affect their personality and behavior in the future, is not expected among adolescents. Specifically, this study intends to analyze how family relationships and online friendships affect adolescents' loneliness and mental health during the COVID-19 pandemic, as shown in Figure 1. A correlation analysis was also conducted to determine the relationship between demographic characteristics with family relationships, online friendships, loneliness, and mental health in adolescents.

Figure 1
Hypothesized Model
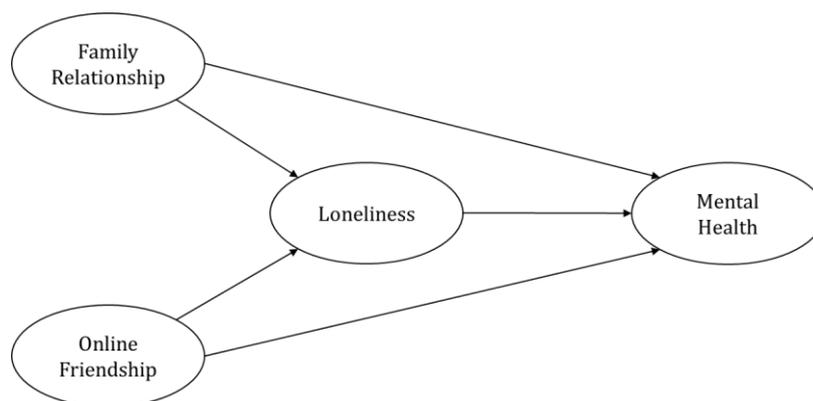
Method

Research Design

This study uses an explanatory research design, with survey research, to explain the relationship and influence between variables through hypothesis testing (Edmonds & Kennedy, 2016). The research was conducted in March-April 2021 in Jakarta, Indonesia. During the data collection, Jakarta began as the province with the highest confirmed cases of COVID-19 in Indonesia and implemented the public activity restriction policy so that all students were required to stay at home. Participants were recruited through school and were contacted via messages to explain the study's purpose and link to an online questionnaire. The procedures and informed consent were provided on the first page of the questionnaire. This study was ethically approved by the Institute of Research and Community Service Ethics Committee at IPB University number 350/IT3.KEPMSM-IPB/SK/2021.

Participants

Research participants were selected by the cluster random sampling method, starting with selecting two junior high schools and two senior high schools based on data from the DKI

Jakarta Province education unit. Then, the total class was determined from each school, and randomization was performed again to select three classes from each school. All students in the selected class became participants in this study. Two hundred ninety-two adolescents aged between 12 and 18 gave consent to participate in this study. Table 1 shows among these participants, 73.6% were females, and 26.4% were males. They were middle and high school students from four different schools in Jakarta, Indonesia. Most participants had intact families, while 14% came from non-intact families.

Table 1

Demographic Characteristics

Characteristics	*n*	*%*
Gender		
Male	77	26.4
Female	215	73.6
Paternal level of education		
Elementary education	15	5.1
Secondary education	123	42.2
Tertiary education	139	47.6
Maternal level of education		
Elementary education	21	7.2
Secondary education	143	49.0
Tertiary education	121	41.4
Paternal working status		
Employed	260	89.1
Unemployed	17	5.8
Maternal working status		
Employed	114	39.0
Unemployed	171	58.6
Family status		
Intact family	252	86.0
Non-intact family	40	14.0
Family size		
Small family (≤ 4 persons)	147	50.3
Medium family (5-7 persons)	142	48.6
Big family (≥8 persons)	3	1.0
Per capita income (IDR)[a]		
< IDR 683,339.00	84	28.8
≥ IDR 683,339.00	208	71.2

[a]IDR (Indonesian Rupiah)

Instruments

The data was collected using four instruments; all were administered in Indonesian. Family relationship was estimated using the modified Brief Family Relationship Scale (BFRS) (Fok et al., 2014). It consists of 16 items with three subscales: cohesion, expressiveness, and conflict. Each item is rated on a 4-point scale from *very unsuitable* (1) to *very suitable* (4). The item discrimination index ranged from .322 to .785, with reliability α=.915.

Online friendship was estimated using the modified Online Friendship Scale (Helmi et al., 2017). It consists of 19 items in four subscales: mutual support, voluntariness, companionship, and sharing. Online friends might be strangers that people have made on social media or offline pals who also communicate online. Participants rate each item on a 6-point scale from *never* (1) to *always* (6). The item-total correlation index is between .512 - .750, with Cronbach's alpha of .902.

Loneliness was estimated using the modified UCLA Loneliness Scale Version 3 (Russell, 1996). It consists of 20 items in three subscales referring to (Austin, 1983):

belonging and affiliation, intimate others, and social others. The items are rated on a 6-point scale from *never* (1) to *always* (6). Internal consistency was .927 showing strong reliability, while the item discrimination index varied from .457 to .810.

Mental health was estimated using the modified Mental Health Continuum-Short Form (MHC-SF) (Keyes, 2002). It consists of 14 items in three subscales: emotional or subjective, social, and psychological well-being. Each item is rated on a 6-point scale from *never* (1) to *always* (6). The item discrimination index ranged from .558 to .779, with Cronbach's alpha value of .870.

Data Analysis

Processing and data analysis were conducted with IBM SPSS 25.0 and LISREL 8.80, using 2-tailed tests with a significance level < .05. The scores for family relationships, loneliness, and mental health were indexed and grouped into three categories based on Bloom's cut-off point, namely low (<60), moderate (60-80), and high (>80). The statistical analysis used is descriptive, correlation test, and Structural Equation Modeling (SEM). Descriptive analysis is used to identify each variable's mean and standard deviation. Correlation tests were performed to analyze the relationship between demographic characteristics with family relationships, online friendships, loneliness, and mental health. SEM is carried out with a confirmatory approach to conduct model estimation and analyze the association between the constructs. In this research model, the subscale acts as an indicator of the latent construct.

Results

The average index of adolescents' family relationships, online friendships, and mental health is moderate. Meanwhile, the average index of adolescent loneliness is in a low category (see Table 2).

Table 2

Mean, Standard Deviation, and Percentage of Each Variable

Variable	Category (%)			Mean	SD
	Low (<60)	Moderate (60-80)	High (>80)		
Family relationship	30.5	58.9	10.6	76.9	11.2
Cohesion	4.5	45.5	50.0	80.2	11.2
Expressiveness	27.1	45.2	27.7	70.9	17.7
Conflict	84.2	14.0	1.7	48.9	13.1
Online friendship					
Voluntariness	22.9	49.7	27.4	71.8	14.5
Mutual support	44.9	40.4	14.7	62.1	17.2
Companionship	63.7	33.2	3.1	56.8	14.7
Sharing	30.5	55.5	14.0	67.1	14.1
Loneliness	62.0	31.8	6.2	58.8	17.8
Intimate others	55.1	32.5	12.3	53.6	14.9
Social others	71.9	24.0	4.1	54.3	14.5
Belonging and affiliation	71.9	24.0	4.1	56.4	14.6
Mental health	24.3	60.3	15.4	68.1	12.4
Emotional well-being	19.8	58.6	21.6	70.3	13.7
Social well-being	31.8	53.1	15.1	67.4	13.4
Psychological well-being	26.7	51.0	22.3	67.6	14.2

Table 3 presents correlation results between participants' demographic characteristics and all variables studied. Adolescent age and gender, maternal working status, and family status were significantly related to family relationships. Male adolescents were found to have better family relationships. The older the adolescent, the higher the quality of family

relationships. Teenagers from intact families with unemployed mothers have better family relationships.

Table 3
Correlation Analysis

Participant characteristics	Correlation coefficient			
	Family relationship	Online friendship	Loneliness	Mental health
Adolescents' age	-.197**	.078	.201**	-.132*
Adolescents' gender (0=male; 1=female)	-.122*	.130*	.241**	-.119*
Fathers' age	.102	.052	-.112	.166**
Fathers' education	.054	-.004	-.053	.104
Fathers' working status (0=unemployed; 1=employed)	.114	-.048	.159**	.032
Mothers' age	.030	-.070	.014	.053
Mothers' education	.027	.012	-.008	.012
Mother's working status (0=unemployed; 1=employed)	-.129*	.069	.032	.032
Family status (0=intact; 1=non-intact)	.156**	.030	-.159**	.146*
Family size	.016	-.028	-.044	.054
Income per capita	-.050	.003	-.074	.024

*Significant at the .05 level; **significant at .01 level (2-tailed)

Loneliness is impacted by age, gender, father's work status, and family status. Female adolescents are more likely to have higher rates of loneliness than males, and it has been found that the older the adolescent, the higher the level of loneliness. Teenagers with working fathers and from non-intact families are lonelier.

While adolescent mental health is influenced by age, gender, paternal age, and family status. Female adolescents have lower mental health than males; the older adolescents are, the worse their mental health becomes. Adolescents from intact families have better mental health.

Figure 2
Structural Equation Model Predicting Loneliness and Mental Health
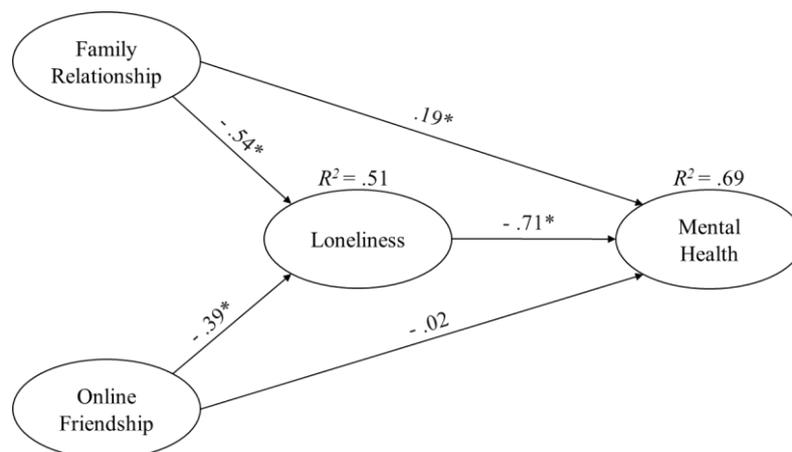
The SEM analysis results show the model's fit indices were $\chi^2 = 169.14$, $df = 59$, $p > .05$, RMSEA = .08, CFI = .97, and GFI= .91, indicating a good fit to the data. Significant path coefficients (95% CI) between the variables are illustrated in Figure 2. To simplify the presentation, the model does not show latent variable indicators and error terms. Loneliness was the mediator of the relationships between family relationships and online friendships

with mental health. As predicted, family relationships and online friendships were linked with loneliness, predicting adolescent mental health.

The indirect effects of the variables were examined and summarized in Table 4. Loneliness as an intermediate factor significantly mediated family relationships and online friendships with adolescents' mental health. Nonetheless, the direct effect of online friendship on mental health was not statistically significant. However, if comparing the total effect on each path, the direct influence of the lonely variable on mental health is the largest, with a path coefficient value of .71. This finding shows that loneliness is the most dominant variable in influencing mental health compared to family relationships and online friendships.

Table 4

Effects Decomposition of Factors Affecting Adolescents' Loneliness and Mental Health

Variable	Direct Effect	Indirect Effect	Total Effect
Loneliness			
1. Family relationship	- .54*	-	- .54*
2. Online friendship	- .39*	-	- .39*
Mental health			
1. Family relationship	.19*	.38*	.57*
2. Online friendship	- .02	.27*	.25*
3. Loneliness	- .71*	-	- .71*

* Significant at the .05 level

Discussion

Adolescence is a turbulent period that must be passed, known as a time of stress and storm (Casey et al., 2010). Since early adolescence, chemical and physical changes in the brain result in a neural mismatch characterized by increased emotions in response to natural and perceived stressors (Bailen et al., 2019). But, adolescents face many challenges and opportunities, including building and fostering social relationships and maintaining mental health (P. K. Smith, 2016). Adolescents are clearly at higher risk for experiencing psychological problems during the pandemic due to adolescent developmental characteristics and the fact that adolescents study online, spend most of their time at home, and are physically separated from their friends (Magson et al., 2021).

Family relationships and online friendships have a significant negative effect on loneliness. Loneliness in teenagers can be predicted by less harmonious family connections, characterized by low levels of support, commitment, and openness of expression as well as excessive conflict within the family. Adolescents with good family relationships are less affected by physical distancing policies than those with low-quality family relationships, who are more likely to feel lonely during the COVID-19 pandemic (Orben et al., 2020). Quality online friendships are characterized by high mutual support, a sense of community, and sharing activities that reduce adolescent loneliness. Through submitted status updates, images, and comments, teenagers can indirectly access their friends through online friendships (Skues et al., 2012). Adolescents often use social media to express their feelings and frustration to online friends (Niederkrotenthaler et al., 2019). This situation makes them feel more connected to others and reduces their feeling of isolation (Skues et al., 2012).

During this pandemic, it would be good if adolescents had a strong support system, such as family and online friends. On the other hand, it would be different if adolescents' family relationships and online friendships were not supportive; they would easily experience loneliness. Long-term feelings of loneliness can predict mental health problems in the long term (Pamela Qualter et al., 2010). Loneliness causes the feeling of being unloved, helpless, worthless, and abandoned (K. Smith, 2019). It may be more difficult for

people who feel lonely to encounter their interpersonal problems; therefore, loneliness might negatively affect self-esteem (Yılmaz et al., 2013) and be connected to personal well-being (Lyyra et al., 2021).

Loneliness mediates family relationships and online friendships, and mental health among adolescents. Loneliness partially mediated family relationships and mental health and fully mediated online friendship and mental health. It shows that adolescents with poor-quality family relationships and online friendships are more likely to feel lonely, causing low mental health. In contrast, adolescents with good family relationships and online friendships tend to feel less lonely and have better mental health. Loneliness is a mediator between family functioning (adaptation and cohesion) and the mental health of vocational high school students during the COVID-19 pandemic (Pan et al., 2021). Longitudinal loneliness has also been reported to mediate adolescent mental health and well-being (Jose & Lim, 2014; Pan et al., 2021; Pamela Qualter et al., 2010).

The COVID-19 pandemic can positively and negatively affect family relationships and adolescent mental health. Teenagers experience anxiety and worry because they fear contracting COVID-19, restricted access to facilities like schools and hospitals, and limited social interaction with friends and relatives (Fegert et al., 2020). This situation is also very likely to occur in every family member, which can risk causing conflict and worsening family relationships (S. M. Brown et al., 2020; Fegert et al., 2020; Magson et al., 2021). Deteriorating the quality of family relationships causes feelings of loneliness in teenagers (Pan et al., 2021), leading to low mental health (Isumi et al., 2020; Pan et al., 2021). Furthermore, the pandemic may also positively affect adolescents' mental health. Family members who spend more time together may develop stronger cohesion and bonds (Fegert et al., 2020). This family relationship can help adolescents reduce fear and stress due to the pandemic, ultimately reducing loneliness (Cooper et al., 2021) and positively impacting mental health (S. M. Brown et al., 2020; Isumi et al., 2020).

Family systems theory identifies the relationship between family members as an element that plays an essential role in the lives of adolescents (Andolfi, 2013; Minuchin, 2018). The results showed that the average adolescent family relationship index was moderate. These findings indicate that most adolescents perceive that their family relationships are of sufficient quality, characterized by commitment, support, openness, and low levels of conflict among family members (Fok et al., 2014).

Family relationship is influenced by age, maternal employment status, and family status. The older the teenager, the lower the quality of family relationships. Along with increasing age, adolescents become more independent, and communication with parents decreases (Parra et al., 2013). Families with working mothers were found to have a lower quality of family relationships. Working mothers have dual roles: domestic and public. In this condition, mothers often lack time to establish close interactions with family members, especially children (Nezhad, 2013). Intact families have a better quality of family relationships; however, non-intact families (parents divorced or one of them has died) have a lower quality of family relationships. Incomplete or non-intact families (post-divorce) present more communication difficulties, parental conflict, and lower family cohesion than intact families (Afifi et al., 2015; H. D. Johnson et al., 2001; McManus & Nussbaum, 2011).

Nowadays, online friendship is an inseparable part of adolescents' daily life (Davis, 2012). Especially in the COVID-19 pandemic, online friendships can be a solution to sharing or exchanging information, building networks with new people, and maintaining relationships with old friends from the real world without meeting face-to-face (Helmi et al., 2017). Text messaging and chatting via social media allow adolescents to maintain a sense of connection with one another regardless of their time or physical location (Davis, 2012). Most adolescents have online friendships in the moderate and high categories, indicating that most adolescents have built quality online friendships through social media.

Loneliness is a feeling of discomfort, loss, and dissatisfaction resulting from the incompatibility of desired social relationships with actual social relationships (Fry & Debats, 2002; Perlman & Peplau, 1982). Four out of ten adolescents experience loneliness in the moderate and high categories, indicating that some adolescents are unsatisfied with their social relationships or cannot achieve the desired ones. Several related studies have also reported increased adolescent loneliness during the COVID-19 pandemic (F. Chen et al., 2020; Ellis et al., 2020; Wang et al., 2020). Female adolescents experience higher levels of loneliness, similar to the result of previous research (Bayat et al., 2021; Goosby et al., 2013; Lee & Goldstein, 2016). Girls spend more time building social relationships and are more sensitive to a lack of support from friends and family (Lee & Goldstein, 2016).

Loneliness is impacted by age, the father's work status, and family status. Adolescents feel more lonely as they get older. A study on loneliness in adolescents and adults found loneliness increases from early adolescence (age 13 years) to the mid-20s (von Soest et al., 2020). Adolescents to young adults are vulnerable to loneliness because of the instability of their social network; this can be related to physical changes and self-identity exploration that can make adolescents vulnerable to exclusion (P. Qualter et al., 2013; Pamela Qualter et al., 2015). Adolescents with working fathers had higher rates of loneliness. Working fathers are less able to be optimally involved in children's activities because they have low control over work schedules (McMunn et al., 2017; Shows & Gerstel, 2009). Adolescents from non-intact families experienced higher loneliness. In the case of families with divorced parents, adolescent loneliness results from parental conflict and low family cohesion (H. D. Johnson et al., 2001). Divorce causes changes in the family structure, increasing the risk of emotional tension between parents and adolescents (Kalmijn, 2013; Wallerstein et al., 2013).

Most participants' mental health is in the moderate category. It indicates that some adolescents are already sufficiently well-off emotionally, socially, and psychologically, thus enabling them to cope with life's stresses, realize their potential, and contribute to their community (World Health Organization, 2004). Adolescent mental health is characterized by age, gender, paternal age, and family status. Adolescent girls have lower mental health. During a pandemic, women suffer a more significant psychological impact and higher levels of stress and anxiety (Wang et al., 2020), thus consistently being associated with a higher risk of low mental health (P. Chen & Harris, 2019; Liu et al., 2020; Rossi et al., 2020). The older the teenager and the older the father, the better the adolescents' mental health. In line with these findings, younger individuals have a bigger chance of developing mental health problems (Rossi et al., 2020). During a pandemic, adolescents face stress and anxiety (Wang et al., 2020). Uncertainty and fear of declining academic achievement also negatively affect the mental health of adolescents who are also students (Wang et al., 2020). The older the father's age, the better adolescents' mental health. Adolescents with intact parents have better mental health than adolescents with divorced or deceased parents. Families with both biological parents provide better developmental outcomes for adolescents with the assumption that parents carry out their functions as a source of emotional support, practical assistance, guidance, and supervision (Amato & Keith, 1991).

The implications of this study's findings may be implemented for developing programs and policies regarding adolescent well-being in Indonesia. Adolescents still had high levels of loneliness (6.2%) and low mental health (24.3%). Therefore, directly educating adolescents on maintaining mental health stability during the COVID-19 pandemic is needed. Educational activities can involve youth directly as ambassadors or volunteers to educate their fellow youths. During the pandemic, educational activities can be packaged in various methods and approached online, such as holding webinars and competitions or sharing audio-visual information through social media.

Adolescents must have an adequate support system to reduce loneliness and improve adolescent mental health. Good quality family relationships have been shown to reduce loneliness and better predict mental health in adolescents. Families can strengthen emotional

bonds, commitment, and support between family members. Families can create an atmosphere that supports open expression, warm interactions, and assertive communication to make adolescents feel accepted and understood by other family members. Parents can empathize with adolescents. Parents need to maintain a positive family atmosphere by responding patiently to each adolescent's complaints and understanding his feelings. Therefore, coaching and guidance to adolescents' families are also needed. So parents can gain better knowledge and skills to provide appropriate care for adolescents, leading to harmonious family relationships.

Based on the result, quality online friendships can reduce loneliness in adolescents. Even if adolescents cannot meet face-to-face with their peers, they can use existing technology to stay connected. However, it must be ensured that the online friendships built positively impact adolescents. Parents can provide encouragement and guidance so adolescents can choose online friends or be involved in good online communities. Adolescents can promote positive activities with their peers, such as studying together or participating in extracurricular or talent interest clubs at or outside of school online.

This research still has some limitations that can be considered for further improvement. First, the absence of observations of all research variables before the COVID-19 pandemic made this study unable to comprehensively identify the particular effects of the COVID-19 pandemic on all variables. Second, the sample used in this research is relatively small and demographically constrained. Therefore, caution is needed in generalizing the study results, given the differences in COVID-19 cases and the different policies for restricting community activities from the government in each region. Future research can be carried out in a broader demographic area, covering rural and urban areas.

Conclusion

Loneliness emerged as a mediator between family relationships and online friendships in adolescents` mental health. Adolescents with unqualified family relationships and online friendships are more likely to experience loneliness, resulting in poor mental health. On the other hand, adolescents with good family relationships and online friendships tend to feel less lonely, which translates into better mental health. These findings should be considered when developing interventions to support adolescent mental health during the pandemic in Indonesia. So there will be more Indonesian youth who realize their potential, work productively, and contribute to their communities.

Declarations

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