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Research Article

The Impact of Online Socialization on Adolescent Mental Health: The Mediating Role of Friendship Quality and Family Relationships

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In the age of advanced information networks, the importance of adolescent mental health has received increasing attention. While previous research has focused on the effects of friendship quality and online socialization behaviors on adolescent mental health, little is known about the mediating variables involved. This study is aimed at exploring the direct and mediating effects of online socialization on adolescent mental health, as well as the role of friendship quality and family relationships. A structural equation model was constructed based on questionnaire results from a sample of adolescents. The results indicated that active social networks promote healthy psychological development in adolescents, either directly or by enhancing friendship quality, but may reduce family relationships and suppress adolescent mental health. Passive social networks with a lack of communication, on the other hand, can negatively affect both friendship and family relationships, resulting in adverse emotions and detrimental effects on healthy development. Based on these findings, this study provides important insights for parents and educators to support the healthy psychological development of adolescents. Specifically, parents and educators should pay attention to adolescents' online socialization behaviors and encourage healthy communication and interaction on social media. They should also promote strong and positive family relationships, which may mitigate the negative effects of passive social networks on adolescent mental health. This study adds to the theory of adolescent psychology research and offers practical recommendations for improving adolescent mental health.

1. Introduction

With the development and iteration of information technology on the Internet, there has been a structural shift in the current daily life and lifestyle. Under the influence of the Internet, today's young people are entirely unable to learn and live without information technology and are called digital natives, with digital technologies and products becoming an essential part of their lives [1]. As of December 2021, the Internet penetration rate of teenagers in China reached 96.8%, and social networking sites' usage rate was 53.4%. With social networking, teenagers are more influenced by online social networking due to their poor self-control and discernment [2]. The issue of the impact of the use of social networking sites on adolescent mental health has become a focus of social and psychological attention. In the context of our study, we focus on Chinese adolescents, a population that has experienced rapid growth in Internet usage and online socialization in recent years. As Internet penetration and social networking site usage rates continue to increase among Chinese teenagers, understanding the impact of online socialization on their mental health becomes increasingly important. Furthermore, cultural factors, such as collectivist values and the importance of interpersonal relationships, may influence how online socialization affects adolescent mental health in this specific context. By investigating the relationship between online socialization and mental health among Chinese adolescents, our study aims at contributing valuable insights to the growing body of literature on this topic and informing potential interventions and policy-making in this area.

Online social activities include active social networks (ASN) and passive social networks (PSN). Active social networks are characterized by direct communication and engagement with others, such as liking, sharing, and commenting on posts and participating in online group discussions. In contrast, passive social networks involve more passive consumption of content, such as scrolling through newsfeeds, reading posts, or watching videos without engaging or interacting with others. These different types of online social behaviors may have varying impacts on adolescent mental health, with active social networks generally being associated with more positive outcomes and passive social networks potentially leading to more negative outcomes. The direct expression of opinions such as chatting and commenting is known as active social networks, while the use of lack of direct communication or interaction such as browsing and diving is known as passive social networks [3]. Online social behavior is universal and has a strong relationship with the individual's psychological state. According to the ecological techno-subsystem theory [4], Internet use impacts individuals' psychological development, social adaptation, and cognitive development. Active social network users use social networking as a tool to enhance and strengthen social relationships and expect to interact with others socially, which positively impacts the individual. Passive social network users lack purpose when socializing online and are prone to information overload due to the large amount of clutter on social networking sites, which harms the individual. Research has shown that active social networking can promote adolescents' sense of belonging, self-esteem, and social support, contributing to better mental health outcomes [5]. On the other hand, passive social networking can lead to social comparison, envy, and feelings of isolation, which may negatively impact adolescent mental health [6]. The underlying mechanism may be related to the level of social engagement and the quality of social interactions experienced by adolescents in these different online contexts. Studies have focused on the relationship between SN and negative psychological states such as missed anxiety, loneliness, and depression and less on positive psychological states. Mental health refers to an individual's psychological and emotional well-being, which encompasses various aspects, such as life satisfaction, the ability to cope with stress, form and maintain healthy relationships, and experience a sense of overall well-being. The dual-factor model of mental health (DFM) [7] considers mental health to be a state of complete integration of the elimination of mental illness and a high level of subjective well-being and can combine positive and negative indicators to reflect individual mental health functions and trends [8]. Therefore, the measurement of adolescent mental health is based on the DFM model, which examines the impact of online social interaction on adolescent mental health in both positive and negative terms and explores the impact of active social networks and passive social networks on adolescent mental health, as well as the mediating role of friendship quality [9] and family relationships (FRs).

Friendship quality is the primary reference and research component for judging and assessing individuals' interpersonal and peer relationships and refers to the support and companionship that individuals receive during peer interactions [10]. And it is a two-way deconstruction directed at the individual, reflecting the emotional connection between two individuals characterized by trust. However, the level of friendship quality is a key factor in adolescents' psychosocial adjustment and psychologically healthy development [11]. Adolescents are more willing to socialize with their peers, making friendship relationships their primary interpersonal relationship and an important protective factor for their mental health and social practice [12]. With the popularity of Internet terminals, online socializing has gradually become an essential tool for young people to self-express and share information. Being authentic and presenting oneself online help get positive feedback from friends, improving friendship quality [13]. Previous research has suggested that friendship quality can serve as a crucial mediator between online socialization and adolescent mental health [14]. High-quality friendships, characterized by trust, support, and understanding, can act as a buffer against the negative effects of excessive online socialization, while low-quality friendships may exacerbate feelings of isolation and loneliness [15]. By examining the mediating role of friendship quality, this study aims at providing a deeper understanding of how online social experiences influence adolescent mental health. Active social networks can improve friendship quality by increasing the frequency individuals receive positive feedback from their friends and reducing uncertainty in their relationships [16].

According to data jointly by UNICEF and the WHO, 20% of adolescents worldwide suffer from mental health problems. During adolescence, family relationships are closely related to the psychological well-being of individuals, and low-quality family relationships characterized by indifference, rejection, and neglect often have a negative psychological impact on adolescents [17]. Excessive use of mobile electronic devices such as mobile phones by parents and children during interaction may lead to a high frequency of conflict [18]. When ecosystem theory was applied to the study of adolescent Internet use, researchers found that the subsystem of information technology influenced individual development through interactions with the family system, particularly the parent-child relationship within the family [19]. Individual media use can crowd out real interpersonal time, resulting in neglect and indifference, affecting family relationships, and leading to conflict between adolescents and their families [13]. For adolescents with relatively homogeneous social relationships, the social support and emotional warmth they receive primarily comes from strong relationships, such as family members. This explains why online socialization can be an underlying cause of parent-child conflict and thus of mental health problems. Family relationships have also been found to play a significant mediating role in the relationship between online socialization and adolescent mental health [20]. Positive family relationships, characterized by warmth, support, and open communication, can mitigate the potential negative impacts of excessive online socialization on adolescent mental health [21]. In contrast, strained family relationships may heighten

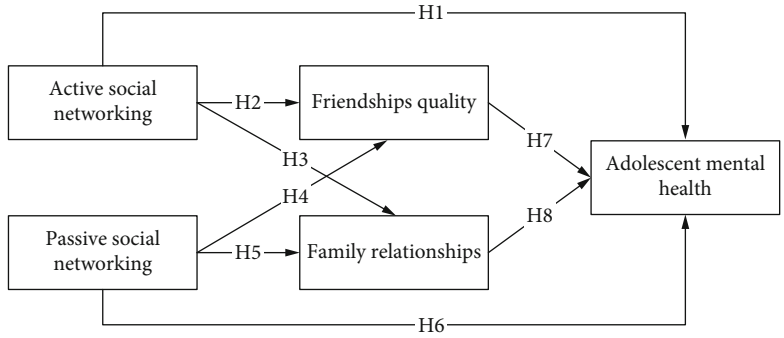

Figure 1: Research model of adolescent mental health factors within the mediating role of FQ and FRs.

the risks associated with excessive online engagement, such as increased feelings of depression and loneliness [22]. By investigating the mediating role of family relationships, this study seeks to provide a more comprehensive understanding of the complex interplay between online socialization, friendship quality, and family dynamics on adolescent mental health. Building on the existing literature and recognizing the importance of the mediating roles of friendship quality and family relationships in the relationship between online socialization and adolescent mental health, our study proposes the following hypotheses:

(1) Active and passive social networks are directly associated with adolescent mental health indicators, with active social networks having a positive impact, while passive social networks having a negative impact on mental health

(2) Friendship quality mediates the relationship between active and passive social networks and adolescent mental health, such that the impact of social networks on mental health is partially explained by the quality of friendships formed

(3) Family relationships mediate the relationship between active and passive social networks and adolescent mental health, such that the impact of social networks on mental health is partially explained by the quality of family relationships

By exploring these hypotheses, our study aims at contributing to the understanding of how friendship quality and family relationships serve as mediators in the relationship between online socialization and adolescent mental health, providing a more comprehensive view of this complex relationship.

The dual-factor model of mental health integrates positive psychology into traditional mental health concepts. It uses subjective well-being as an indicator of positive mental health and psychopathology as an indicator of adverse mental health to provide a more comprehensive assessment of an individual's mental health [8]. Mental health combines the absence of mental illness and the possession of a subjective sense of well-being, including the elimination of negative psychological symptoms and positive psychological experiences, a two-dimensional state of being [23]. In the context of online socialization, the dual-factor model of mental health can help us understand how both positive and negative aspects of adolescents' online experiences contribute to their overall mental health. For example, active social networking may enhance adolescents' life satisfaction and positive effect by fostering social connections and support, while excessive passive social networking might exacerbate loneliness and depressive symptoms by promoting negative social comparisons and isolation. By examining both positive and negative indicators of mental health, this study aims at providing a comprehensive understanding of the complex relationship between online socialization and adolescent mental health and the role of friendship quality and family relationships as potential mediators. Subjective well-being includes life satisfaction and positive and negative emotions, and psychopathological indicators include internalizing and externalizing problems [24]. The DFM assessment system can be composed of positive and negative indicators that can be selected flexibly according to needs, and psychopathy and subjective well-being can be used as indicators of adolescent mental health [25].

This paper aims at investigating the role of friendship quality and family relationships in mediating the relationship between online socialization and positive or negative mental health indicators and to analyze how these factors interact. Specifically, based on the DFM, this paper focuses on adolescents, using life satisfaction and positive affect as positive indicators of mental health and loneliness and depression as negative indicators to explore the relationship between online socialization and adolescent mental health, and hypothesizes that friendship qualities and family relationships play a mediating role in the relationship between them. The SEM model was also used as a research method to explore the pathways and extent of the effects of online socialization on adolescent mental health and to propose measures to protect adolescent mental health.

2. Hypotheses and Research Model

The conceptual framework impacting adolescent mental health is shown in Figure 1. It is hypothesized that active and passive social networks can affect adolescent mental health by affecting the quality of friendships and family relationships. In addition, the two types of social networks can also directly affect adolescent mental health. The modelling and hypotheses are explicitly described in Section 2.

2.1. Active Social Networking. Active social networks refer to the behavior of individuals actively interacting with others on social networking sites by initiating public or private chats; posting photos, pictures, and journals; and updating their status [26]. Therefore, active social networks can help adolescents relieve stress and maintain mental health. Stimulation hypothesis suggests that Internet use promotes social interaction, enhances the closeness of relationships between individuals and the people they interact with, and reduces interpersonal distance; therefore, online interaction with close friends promotes the development and depth of interpersonal relationships [13]. As mobile Internet devices, such as smartphones, become increasingly prevalent, social networking sites have emerged as a vital platform for adolescents to express themselves and share information. Consequently, researchers in related fields have begun to place greater emphasis on examining the influence of social networking site usage on the quality of adolescents' friendships. According to Shahzad and Omar, family relationships are another critical factor influenced by active social networks, and although positive online performance promotes friendships, it has a negative impact on family relationships [27]. Adolescent mental health in turn is strongly influenced by family relationships. Therefore, it can be argued that active social networks can have an impact through the mediating role of friendship quality and FRs, in addition to directly affecting adolescent mental health. Therefore, the following hypotheses were proposed:

Hypothesis 1 (H1). Active social networking has a positive impact on adolescent mental health.

Hypothesis 2 (H2). Active social networking has a positive impact on the quality of friendship.

Hypothesis 3 (H3). Active social networking harms family relationships.

2.2. Passive Social Networking. Passive social networks refer to socializing online by searching and browsing information but not engaging in social activities such as commenting or conversing with others [28]. In contrast to active social networks, passive social networks can generate jealousy while browsing social network information, constantly exposing themselves to positive information about others and generating negative emotions. Passive social networks provide opportunities for upward social comparison, which may increase psychological stress in adolescents due to comparison psychology and survivorship bias, affecting adolescent mental health [29]. Individuals prone to upward social comparison and low life satisfaction may be particularly vulnerable to the adverse effects of social networks. Passive social networking site use hurts adolescents' mental health, i.e., the more adolescents use passive social networking sites, the higher their negative psychological level and the lower their positive psychological level. Therefore, information-browsing social behavior that lacks communication and interaction is not conducive to developing adolescent mental health. Although PSNs may not directly affect the quality of adolescents' friendships, their use has been found to be positively related to self-disclosure within these networks, which in turn can have a positive effect on offline self-disclosure and subsequently influence the quality of friendships [30]. Therefore, the following hypotheses were proposed:

Hypothesis 4 (H4). Passive social networking hurts adolescents' mental health.

Hypothesis 5 (H5). Passive social networking hurts the friendship quality.

Hypothesis 6 (H6). Passive social networking has a negative impact on family relationships.

2.3. Friendship Quality. Friendship is an emotional connection established through two-way self-expression and information exchange between individuals and others in the process of interpersonal communication. The quality of friendship is an essential indicator of the strength of this emotional connection and is also the fundamental characteristic of friendship. Friendship quality is a key factor affecting adolescent individuals' psychosocial adaptation and psychological health development. Therefore, the following hypothesis was proposed:

Hypothesis 7 (H7). Friendship quality has a positive impact on adolescent mental health.

2.4. Family Relationships. According to Laursen and Collins' research [31], adolescence is a crucial stage in individuals' physical and psychological growth, characterized by an increase in conflicts between parents and children. Frequent and high-intensity conflict can have detrimental effects on family relationships, making adolescents feel insecure, as shown in the study by Pettit et al. [32]. Conger et al.'s and Repetti et al.'s study [33, 34] both indicate that certain types of family relationships, such as those marked by poor communication, lack of emotional support, and high levels of hostility, can affect adolescents' sense of interpersonal security, certainty of control, and survival security, leading to various negative emotions such as loneliness, depression, and social anxiety.

However, congenial family relationships, on the other hand, have positive interventions for mental health, specifically emotional warmth, intimacy, and support in the family, and are associated not only with high levels of well-being but also with low levels of stress and depression. With the development of online socialization, the parent-child conflict caused by the excessive use of cell phones by adolescents has become a significant conflict in the family group, and there is a strong link between family relationships and adolescent mental health [35]. Therefore, the following hypothesis was proposed:

Hypothesis 8 (H8). Family relationships have a positive impact on adolescent mental health.

Table 1: Variable measurement scale.

Variables	No.	Items
Active social networking	ASN 1	Frequency of positive self-presentation
	ASN 2	Frequency of honest self-presentation
	ASN 3	Frequency of receiving positive feedback
Passive social networking	PSN 1	Frequency of visiting social networks
	PSN 2	Frequency of upward social comparison
	PSN 3	Number of friends browsing social networks
Friendships quality	FQ 1	Friendship satisfaction
	FQ 2	Positive friendship characteristics (e.g., intimacy and trust)
	FQ 3	Negative friendship characteristics (e.g., competition and conflict)
Family relationships	FR 1	Relationship with father
	FR 2	Relationship with mother
	FR 3	Relationship between father and mother
Adolescent mental health	AMH 1	Satisfaction with existing life
	AMH 2	Loneliness in daily life
	AMH 3	Depression level of the psyche

3. Methodology

3.1. Sample and Data Collection. With the spread of mobile Internet terminals such as smartphones, smartwatches, and tablets, more and more people are accessing mobile web-based social media. Mascheroni and Ólafsson found that there is a trend towards a younger age group of users engaging with social media platforms and using mobile devices for communication and content consumption [36]. Online socialization has the advantage of being quick and easy, but much information is difficult to distinguish from the truth. Adolescents are intensely curious about the unknown, and online socialization is extremely attractive. Therefore, it is crucial to clarify the impact of online socialization on the psychology of adolescents, which is related to shaping their personal qualities. This study used a questionnaire method to collect data. Four secondary schools were selected within Hubei Province. Consent was obtained from the school authorities prior to the survey. Two classes were randomly selected within the sampled schools by stratified sampling in the first and second years of junior high school and senior high school to ensure a representative sample. A total of 813 questionnaires were distributed, and after excluding invalid data, 775 valid questionnaires were obtained, with an effective rate of 95.3%. Invalid questionnaires were judged based on apparent patterns of responses or logical inconsistencies. The subjects were aged 12 to 18; 367 (47.4%) were senior high school students, 408 (52.6%) were junior high school students, 400 (51.6%) were male, and 48.4% were female.

3.2. Measures. When designing a measurement scale for the model, reflective measurement models are appropriate in most cases. All the variables in this paper are latent; therefore, the Likert scale was chosen for the strategy of the variables of interest in this paper. Each variable was designed with three self-formulated items to measure the variables associated with adolescent mental health and its associated variables. The indicators of all measurement items are shown in Table 1.

Active social networking: active social networking behavior is mainly reflected in self-presentation and receiving feedback on social media by adolescents. Self-presentation is the act of presenting oneself in front of others in order to make them see oneself in the way one wants. Self-presentation in social networking sites can be divided into positive self-presentation, in which individuals selectively present information that helps build a positive image of themselves, and honest self-presentation, in which individuals present more comprehensive information based on their actual situation. In addition, positive feedback also plays an essential role in online socialization and significantly impacts adolescent mental health. Therefore, the measurement scale of ASN includes the frequency of positive self-presentation, the frequency of honest self-presentation, and the frequency of receiving positive feedback.

Passive social networking: the browsing frequency affects the information an individual receives. After receiving information, adolescents lack social experience and judgment of online information, leading to judgment failure. Therefore, the measurement scale of PSN includes the frequency of visiting social networks, frequency of upward social comparison, and number of friends browsing social networks.

Friendship quality: friendship functions mainly through friendship quality; therefore, friendship quality is an essential factor affecting adolescents' psychological health. Among the studies on friendship quality, friendship characteristics and friendship satisfaction are the key categories. Friendship characteristics focus on friendship attributes, including intimacy, companionship, and conflict. The characteristics of friendship are not independent of each other but work together for the individual. On the other hand, friendship satisfaction is an individual's overall assessment of the extent to which the quality of his or her friendship satisfies his or

Table 2: Reliability and validity test.

Variables	Item	Factor loading	Mean	Standard deviation
ASN: Cronbach's α = 0.841 CR = 0.794; AVE = 0.586	ASN 1	0.773	3.55	1.06
	ASN 2	0.802	3.49	1.05
	ASN 3	0.781	3.51	0.99
PSN: Cronbach's α = 0.837 CR = 0.807; AVE = 0.614	PSN 1	0.792	3.68	1.13
	PSN 2	0.832	3.64	1.05
	PSN 3	0.815	3.57	0.97
FQ: Cronbach's α = 0.825 CR = 0.853; AVE = 0.589	FQ 1	0.753	3.35	1.03
	FQ 2	0.765	3.31	0.98
	FQ 3	0.794	3.36	1.02
FR: Cronbach's α = 0.856 CR = 0.833; AVE = 0.593	FR 1	0.783	3.85	1.12
	FR 2	0.764	3.80	1.05
	FR 3	0.767	3.78	1.14
AMH: Cronbach's α = 0.891 CR = 0.864; AVE = 0.602	AMH 1	0.796	3.43	0.99
	AMH 2	0.755	3.47	1.16
	AMH 3	0.789	3.50	1.08

Note: Cronbach's α=Cronbach's alpha; CR=construct reliability; AVE=average extracted variance.

Table 3: Correlations among variables.

	ASN	PSR	FQ	FR	AMH
ASN	0.766	—	—	—	—
PSN	-0.397	0.784	—	—	—
FQ	0.405	-0.423	0.767	—	—
FR	-0.367	-0.482	0.504	0.770	—
AMH	0.332	-0.518	0.462	0.439	0.776

Note: the diagonal elements are the square root of the AVE.

Table 4: Test of theoretical hypotheses.

Hypothesis	Relationship	Std. path coefficient	T value	P value
H1	ASN → AMH	0.197	9.112	<0.001
H2	ASN → FQ	0.252	6.247	<0.001
H3	ASN → FR	-0.230	5.662	<0.001
H4	PSN → AMH	-0.248	7.548	<0.001
H5	PSN → FQ	-0.321	10.422	<0.001
H6	PSN → FR	-0.305	8.581	<0.001
H7	FQ → AMH	0.375	8.129	<0.001
H8	FR → AMH	0.331	6.634	<0.001

Note: χ^2/df = 1.437, CFI = 0.979, RFI = 0.923, NFI = 0.940, PCFI = 0.712, RMSEA = 0.030, GFI = 0.935.

her psychological needs. Therefore, the measurement scale of FQ includes friendship satisfaction, positive friendship characteristics (e.g., intimacy and trust), and negative friendship characteristics (e.g., competition and conflict).

Family relationships: both family systems theory and coparenting theory point out that the relationship between adolescents and both parents needs to be examined simultaneously in the study of family relationships. Fathers and mothers play different roles in adolescents' development, with fathers providing role-modelling power for adolescents' development and mothers providing care and assistance to adolescents in daily life. In addition, the couple's relationship with their parents also profoundly affects adolescents' psychological health. Therefore, the measurement scale of FR includes the relationship with the father, the relationship with the mother, and the relationship between the father and mother.

Adolescent mental health: DFM divides mental health evaluation indicators into objective evaluations of physical aspects and subjective evaluations of well-being; therefore, the measurement of adolescent mental health needs to fully consider objective facts and subjective feelings. Therefore, the measurement scale of adolescent mental health includes satisfaction with existing life, loneliness in daily life, and depression level of the psyche.

The Likert scale is one of the most used rating summation scales. The scale consists of a group of statements, each of which has five answers, namely, "strongly agree," "agree," "not necessarily," "disagree," and "strongly disagree," which are recorded as 5, 4, 3, 2, and 1, respectively. The total score of each respondent's attitude is the sum of his answers to each question. This total score indicates his attitude or different status on this scale.

3.3. Scale Validity and Reliability. The reliability and validity of the questionnaire data are important indicators of its credibility. The reliability analysis mainly concerns Cronbach's alpha, which is the consistent result of the questionnaire data. Its benchmark level lies within the [0,1] interval, and when Cronbach's alpha is more significant than 0.7, it indicates good reliability of the questionnaire data [37]. According to Aamaro et al. [38] and Congsheng et al. [39], the aggregated validity of the questionnaire data is good when the factor loadings exceeded the recommended value of 0.7, the construct reliability (CR) exceeded the recommended value of 0.7, and the average extracted variance (AVE) exceeded the recommended value of 0.5. As illustrated in Table 2, Cronbach's α (range = 0.825 – 0.891), CR (range = 0.794 – 0.864), and AVE (range = 0.586 – 0.614) of every variable and the normalized factor loading (range = 0.753 – 0.832) satisfy the relevant requirements.

Discriminant validity is used to indicate the correlation between a measured variable and the categorical variable to which it belongs and is tested in this paper by comparing the square root of AVE and the correlation coefficient between the variables [26]. Table 3 shows that the square root of the AVE (diagonal value) for all five variables is greater than the correlation coefficient between the variables, indicating that the discriminant validity passes the test, and the data is highly discriminant.

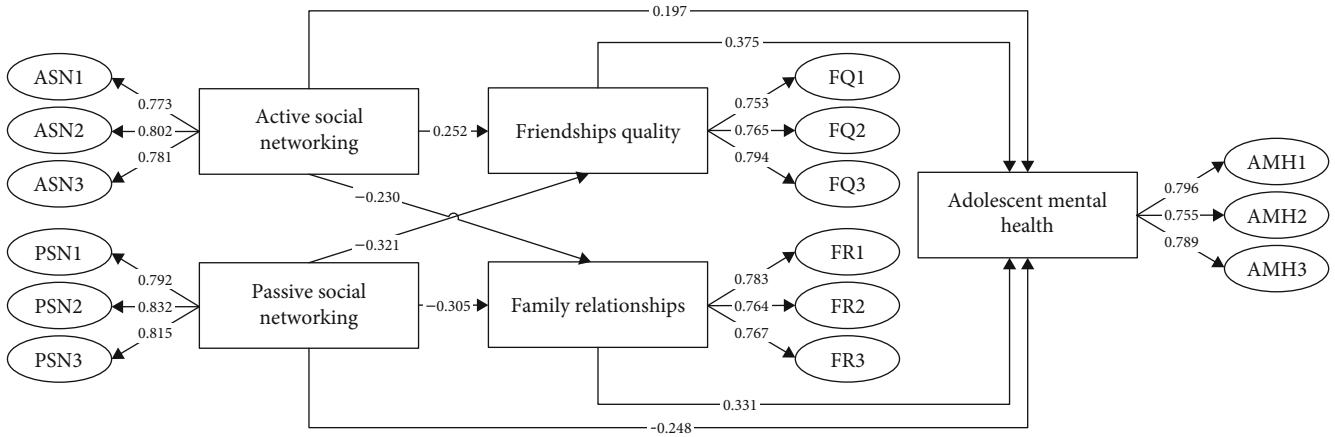

Figure 2: Results of SEM analysis.

Table 5: Influence coefficient of independent variables.

Causal relationship	Influence path	Path coefficient	Total coefficient
ASN → AMH	ASN → AMH	0.197	0.216
	ASN → (FQ) → AMH	0.095	
	ASN → (FR) → AMH	-0.076	
PSN → AMH	PSN → AMH	-0.248	-0.468
	PSN → (FQ) → AMH	-0.120	
	PSN → (FR) → AMH	-0.100	

4. Data Analysis and Results

4.1. Data Analysis Strategy. We employed structural equation modelling (SEM) to analyze the relationships between the latent variables in our study, as it allows us to examine complex relationships between concepts that cannot be directly observed. SEM is particularly suited for research in disciplines such as sociology, psychology, education, and market research. Our SEM consists of a measurement model and a structural model, where the measurement model contains a latent variable and a set of observed variables, and the structural model is a causal model reflecting the process of action and estimates between potential variables.

There are two main types of SEM: covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM). We chose to use CB-SEM in our analysis because it is better adapted to complex models with large amounts of data (our study utilized 775 questionnaires to examine 15 items). Furthermore, CB-SEM allows us to divide the measured variables into groups, each corresponding to a latent variable. To estimate the parameters in our model, we used the maximum likelihood method.

4.2. Test of Theoretical Hypothesis. This study used active and passive social networks as independent variables, friendship quality and family relationships as mediating variables, and adolescent mental health as dependent variables to build a structural equation model. The results of the AMOS test are shown as footnote to Table 4, which illustrates that the values of the suitability indicators meet the criteria. Therefore, the hypothetical model was sufficient for the next step of SEM. The final model and calculation results were demonstrated in Figure 2 and Table 4, and all hypotheses were supported. These results indicate that both ASN and PSN can directly impact adolescent mental health. In addition, these two indicators can indirectly affect adolescent mental health through the mediators FQ and FR.

4.3. Test of the Mediating Role of Friendship Quality and Family Relationships. The direct impact is the effect of exogenous latent variables on the outcome variable and can be measured by the path coefficient between them. When a mediating variable is present, the effect of the latent variable on the outcome variable is to be calculated by indirect impact. There are two mediating variables in this study, and the indirect effect is the sum of the products of the path coefficients through each mediating variable affecting the outcome variable. The results of the path effects of the two independent variables, ASN and PSN, on AMH are shown in Table 5.

The calculated results showed a significant total effect of ASN on AMH ($c = 0.216$, $p < 0.001$), a significant indirect effect of ASN on AMH via FQ ($a * b = 0.095$, $p < 0.001$), and a significant indirect effect of ASN on AMH via FR ($a * b = -0.076$, $p < 0.001$). This suggested that both FQ and FR partially mediated between ASN and AMH. Similarly, there was also a significant total effect of PSN on AMH ($c = -0.468$, $p < 0.001$), and both FQ and FR played a partially mediating role between PSN and AMH. ASN has a significant positive effect on AMH, while PSN has a significant negative effect on AMH. And PSN's negative effect was more significant than ASN's positive effect. Adolescents' ASN promotes their bonding with their friends, which leads to better AMH levels. Conversely, PSN causes adolescents to receive negative feedback in friendships and family, thus negatively affecting AMH.

5. Discussion

In this paper, happiness, loneliness, and depression were used to assess adolescent mental health. The results of the SEM analysis indicate that active social networks contribute

to adolescent mental health as a whole and promote adolescent mental health through friendship quality and suppressing adolescent mental health through family relationships. This is consistent with earlier research that emphasizes the importance of social networks in shaping adolescent mental health [40, 41]. Active social network use can delay and suppress feelings of loneliness and depression and enhance adolescent well-being [42].

Social networking sites are an essential tool for social interaction among young people, and their anonymity, secrecy, and nonimmediate nature enhance the interaction and communication between individuals and others [43]. Especially for those less able to interact offline, the online environment can stimulate individuals to perform more active use behaviors in hidden interactions and thus reduce their negative emotional experiences, such as loneliness [44]. This finding is in line with previous studies that have identified the positive impact of online communication on adolescent mental health [45].

On the other hand, passive social networks have a direct negative effect on adolescent mental health and negatively affect adolescent mental health through two mediators, with high coefficients for each pathway, suggesting that its impact on adolescents cannot be ignored [46]. This finding is consistent with previous research that has emphasized the negative consequences of passive social network use for adolescent mental health [47].

This differential adaptation result indicates that adolescents should selectively increase active social networks and reduce unnecessary passive social networks. Active social networks are usually a purposeful, planned, and active behavior, so individuals have better control and management over the whole use process [48]. Meanwhile, active social networks may also be accompanied by dynamic creative or authoring behaviors, thus facilitating the expansion of learning abilities and enhancing a sense of achievement [49]. Accordingly, parents and educators should focus on guiding and encouraging young people to engage in purposeful and planned active social networks to play an active role in their individual growth and socialization.

The implications of these findings for research, policy, and intervention are crucial. First, future research should continue to examine the complex relationships between active and passive social network use and adolescent mental health, incorporating additional variables and potential mediators. Second, policymakers should consider the potential impact of social networking on adolescent mental health when developing guidelines and regulations for social media platforms. Finally, interventions targeting adolescent mental health should focus on promoting active social network use and reducing passive use, helping adolescents develop healthy online habits that contribute to their overall well-being.

In conclusion, our findings contribute to the growing body of literature on the impact of social networking on adolescent mental health. By examining the differential effects of active and passive social network use, this study provides valuable insights for researchers, policymakers, and practitioners seeking to understand and promote adolescent mental health in the digital age.

6. Conclusions

In conclusion, this study is aimed at clarifying the active and passive social networking's influence on adolescent mental health, involving two mediating variables, friendship quality and family relationships. The study found that active social networking can enable an overall positive direction in adolescent mental health, as it promotes adolescent mental health by enhancing the quality of friendships while inhibiting adolescent mental health by making family relationships worse. In contrast, passive social networking significantly inhibits adolescent mental health, as it weakens the quality of friendships and family relationships of young people, thus worsening their psychological state. Therefore, adolescents need to be guided by their mentors to perform active social networks appropriately while reducing passive social network frequency to improve their mental health levels.

However, there are also several limitations to this study. Firstly, the sample was limited to secondary school students from four schools in Hubei Province, limiting the findings' generalizability to other regions and populations. Future research should aim at including a more extensive and diverse sample to improve the generalizability of the results. Secondly, while the study proposed several hypotheses and established associations between the independent and dependent variables through structural equation modelling (SEM), the causal relationships between these variables were not established through long-term studies or experimental designs. This limits the ability to infer causal relationships between the variables and highlights the need for further research to confirm and establish causal relationships in the research model. Lastly, the data were obtained through self-reported questionnaires, which are subject to response bias and may not accurately reflect the actual behaviors and experiences of the participants. Future studies could incorporate additional data collection methods, such as interviews or observations, to provide a more comprehensive understanding of the factors influencing adolescent mental health.

Overall, this study provides important insights into the effects of active and passive social networking on adolescent mental health and highlights the need for appropriate guidance and regulation of adolescent social networking behaviors. The findings of this study can serve as a reference for enhancing the mental health levels of adolescents, and future research can build upon these findings to further explore the complex relationships between social networking and mental health.

Data Availability

The labeled data set used to support the findings of this study is available from the corresponding author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

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