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ARTICLE

Moderating Mechanism in the Relationship between Social Isolation and Mental Health among College Students during High-Risk Period of COVID-19 Transmission in Hubei, China

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ABSTRACT

This study explored the effect of perceived social isolation on the mental health of college students during the high-risk period of COVID-19 transmission in Hubei, China and the role of social support from online friends in alleviating this effect. The questionnaire responses of 213 college students from four universities in Hubei were included. Measurement and structural models were constructed using structural equation modeling. The findings revealed that perceived social isolation while under home quarantine was a negative predictor of the mental health of college students in Hubei. Low social support from online friends may lead to a relatively strong relationship between perceived social isolation and mental health in these college students, whereas high social support from online friends may lead to a relatively weak relationship between perceived social isolation and mental health.

KEYWORDS

Social isolation; social support; mental health; moderator; Hubei

1 Introduction

Each individual has a crucial role in preventing coronavirus disease 2019 (COVID-19); one of the tools used to prevent the transmission of COVID-19 has been quarantines, particularly during periods when the risk of transmission of the disease is high [1]. After COVID-19 rapidly broke out in Wuhan City, Hubei Province, China on January 23, 2020, the city was blockaded [2]. From January 24, 2020, to March 23, 2020, a strict home quarantine policy was implemented across Hubei Province [3,4]. An investigation into the effect of the prolonged home quarantine on the psychological condition of the residents of Hubei, who could not venture freely outside of their homes for a period of more than 2 months, was warranted. The residents felt social isolation because they had lost face-to-face social contact with other people [3–5].

In general, people are adapted to receiving stimuli from the environment and interacting with others; therefore, the social isolation perception of prolonged (i.e., 24 h or more) home quarantine with a lack of environmental stimuli and social interaction may lead to feelings of stress, anxiety, and anger [5–8]. This claim, namely that the perceived social isolation of home quarantine is associated with declining mental

health, has been supported by other studies and has been shown to be especially true in the case of college students [9,10].

While under home quarantine, college students in Hubei received social support from parents and online friends, and this may have reduced the negative effect of their social isolation perception [5,6,8,11–13]. Normally, an individual adapts his or her attitude and behavior to the external environment [14]. The amount of social support received by an individual affects his or her stress level and mental health, and according to stress buffering theory, affects the relationship between perceived social isolation and mental health [9,11,15,16].

The current study discussed the effect of perceived social isolation of home quarantine on the mental health of college students in Hubei and the role of social support from parents and online friends in alleviating this effect. The study provided recommendations to Chinese university staff and counselors on how to support and preserve the mental health of students who were experiencing social isolation.

1.1 Current Research and Research Hypothesis

Social isolation has been defined as perceived inadequate quality and quantity of social contact with others; having inadequate social relationships influences mental health outcomes [17]. Perceived social isolation can result from living in a confined environment for a prolonged period of time without sufficient social contact and environmental stimuli [5,18], resulting in a series of poor mental health symptoms, such as considerable anxiety and stress [5,6,18]. Moreover, perceived social isolation can negatively affect an individual's psychological functioning [19], giving rise to a potential for severe mental illness and an increased risk for suicide [17,20]. In particular, the level of perceived social isolation while under home quarantine during the COVID-19 pandemic was a predictor of poor mental health outcomes in college students who did not have pre-existing mental health problems [9,10]. Accordingly, this study proposed the following research hypothesis:

H1: Perceived social isolation negatively predicts mental health among college students in Hubei.

To cope with mental health problems while under home quarantine during the COVID-19 pandemic, college students obtained social support from family and online friends [11–13]. Whether from parents or online friends, social support can be psychological or material. Psychological support mainly allows individuals to experience a sense of care and belonging, whereas material support allows individuals to solve problems and obtain financial assistance [21]. A large amount of social support with stress-buffering effects can help prevent young adults from developing poor mental health [12,22,23]. For instance, social support from parents might help college students avoid developing poor mental health during the COVID-19 pandemic [12]; social support from online friends might help individuals avoid the negative effect of social isolation perception on their mental health while under quarantine [13]. Therefore, this study proposed the following research hypotheses:

H2a: Social support from parents positively predicts mental health among college students in Hubei.

H2b: Social support from online friends positively predicts mental health among college students in Hubei.

The differences in social support levels are caused by a moderating mechanism [15,16], which is emphasized under stress buffering theory, revealing that the negative effect of stress is mitigated by involving problem-solving strategies in social support systems and thereby reducing stress reactions to protect mental health [15]. However, the level of social support appears to have strong effects on the relationship of social isolation with mental health [16]; for instance, strong social support results in a weaker stress–mental health relationship, whereas weak social support results in a stronger stress–mental health relationship [15,16]. In this study, college students who were under home quarantine obtained social support mainly from parents and online friends [11,24]. Receiving a large amount of social support

while under home quarantine in a confined environment that otherwise lacks opportunities for social contact enriches environmental stimuli and provides a stress buffer [5,6,8,15,24], thereby ameliorating the effect of perceived social isolation on mental health (i.e., significant stress and anxiety). By contrast, receiving a small or insufficient amount of social support from parents and online friends may enhance the negative effect [5–7,11,15]. Therefore, differences in the amount of social support may result in differences in the intensity of the effect between perceived social isolation and mental health in college students. Therefore, this study proposed the following moderation hypotheses:

H3a: Social support from parents moderates the relationship between perceived social isolation and mental health among college students in Hubei.

H3b: Social support from online friends moderates the relationship between perceived social isolation and mental health among college students in Hubei.

1.2 Hypothetical Model

The current hypothetical model (Fig. 1) was constructed on the basis of previous studies and related theories. Social isolation and mental health were considered to underlie the main effect. Social support from parents and online friends was considered to exert a positive effect on mental health and the moderators of the main effect.

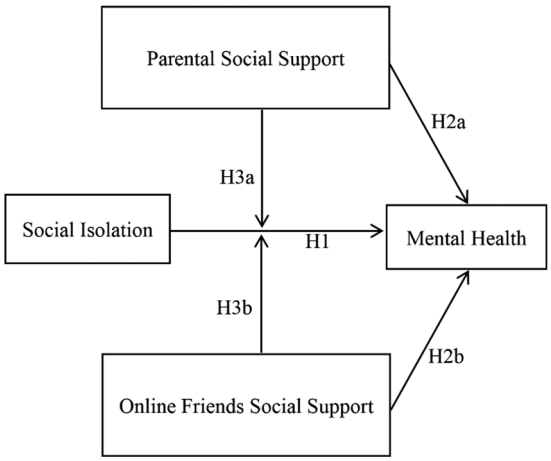

Figure 1: Hypothetical model

2 Materials and Methods

2.1 Participants

Considering the infection risk and restrictions on leaving the house, 346 online questionnaires were sent to students of four universities by university counselors in Hubei from 10–19 March, 2020, on WeChat. In all, 97.7% of participants reported living with their parents while under home quarantine. The participants had the study purpose explained to them first, and then they were asked to provide online written informed consent. Participation was voluntary, and all data were handled confidentially. Moreover, to encourage participation, five disposable masks were provided to each participant as a gift, which could be collected from a specific store. Only individuals who had access to both offline social support (from parents) and online social support (from online friends) during their home quarantine were included. Eventually, 213 valid samples were obtained; all of which were provided by college students in Hubei who lived with their parents while under home quarantine. The participant demographic characteristics are presented in Table 1.

Table 1: Sample demographics

Type	Group	N	%
Gender	Male	94	44.1
	Female	119	55.9
Grade	Freshman	69	32.4
	Sophomore	25	11.7
	Junior	24	11.3
	Senior	60	28.2
	1st year of graduate school	4	1.9
	2nd year of graduate school	19	8.9
	3rd year of graduate school	12	5.6
Quarantine time	Less than three days	3	1.4
	Two weeks	1	0.5
	Three weeks	4	1.9
	More than one month	205	96.2

2.2 Materials

This study measured three interrelated concepts developed by theory and supported by research, and their scales were scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) and defined as follows:

(1) Social Isolation: Social isolation is a feeling without sufficient social communication and social support that worsens health-related quality of life and mental health [17,18]. The degree of social isolation was measured on a six-item questionnaire, comprising three reverse and three forward questions [18].

(2) Social Support: Social support is a psychological protective factor associated with cope stress and anxiety; its protective mechanism appears in the process of interaction with friends and parents [15,16,25]. Here, the degree of social support from parents and online friends was measured on an 18-item questionnaire [25] comprising eight questions related to psychological and material social support from parents and ten questions related to support from online friends. Here, an online friend was defined as any object that was interacted with through the Internet, and thus included both real-life and online-only friends.

(3) Mental Health: Mental health represents the degree of satisfaction with life, level of life meaning, ability to focus on thinking and learning, and satisfaction with self-appearance; here, the degree of mental health was measured on a six-item questionnaire [26].

2.3 Analytical Method

Here, structural equation modeling was used to construct measurement and structural models for the current college students [27–30].

Original data were collated in SPSS and valid samples were executed using AMOS. Consequently, a measurement model was constructed and its reliability and validity were estimated through confirmatory

factor analysis (CFA). First, the sample normality [27,31,32], and Cronbach's alpha coefficient of the questionnaire item categories were calculated. Second, the model fit, factor loading, and variance of these categories were determined. The model fit indices included χ^2, χ^2/df, root mean square residual (RMR), standardized root mean square residual (SRMR), goodness-of-fit (GFI), comparative fit index (CFI), normed fit index (NFI), incremental fit index (IFI), Tucker-Lewis Index (TLI) and parsimony-adjusted normed fit index (PNFI) [27,30,33,34]. Finally, the convergent validity of the questionnaire was explained by calculating the composite reliability (CR) and average variance extracted (AVE), whereas their discriminant validity was revealed using the square root of the AVE and correlation coefficient of the two variables.

A structural direct effect model, constructed according to the current hypothesis model, was used for testing variable relationships. In addition, multigroup analysis was used to compare the different structural models for testing the moderating effects [35,36].

In this study, the relationship with parents and the relationship with online friends were considered and discussed separately because parental support and online friends' support have different effects. In brief, direct effect models were constructed on the basis of social isolation, two social support types, and mental health for verifying H1, H2a, and H2b, and multigroup analysis was employed for verifying H3a and H3b. Default and test models were constructed for evaluating moderating effects. The chi-square difference, which was the indicator of the moderating effect, reached a significant difference between the default and test models [35,36]. The default and test models were constructed on the basis of the main effect of social isolation and mental health; high and low social support groups were divided according to mean social support scores [37]. The high and low groups were constructed for the main effect in the default model and were estimated freely; the model path coefficients of the high and low social support groups for the main effect in the test model were limited to equal each other [35,36]. Thus, a comparison of the model structural parameters of the default and test models was performed under different conditions by multigroup analysis [35,36]. If the chi-square difference of the two models reached significance, the test model of equal path coefficients was rejected, indicating that the main effect has different path coefficients according to the default level of social support. Therefore, a moderating effect is supported.

2.4 Reliability and Validity

The measurement model was constructed after the questionnaire items were correctly coded (Fig. 2). According to the results of factor loadings per variable, items in the measurement model were deemed suitable and retained only when their loading was >0.50. Finally, after the invalid items (including three items from the social isolation questionnaire items with low factor loadings of 0.13, 0.14, and 0.39 and one item with a factor loading of 0.15, from the mental health questionnaire items) were removed, only 26 valid items remained (Table 2), and these were used subsequently.

In this study, the univariate and multivariate normality tests indicated normal distribution. The absolute skewness and kurtosis values were in the range of 0.03–1.17 and 0.01–1.00, respectively [31], and the Mardia coefficient was 360.29 (i.e., lower than $p(p+2) = 728$) [27,32]. Moreover, the Cronbach's alpha values were 0.77, 0.96, 0.96, and 0.92 for questionnaire items on social isolation, social support from parents, social support from online friends, and mental health, respectively (Table 3).

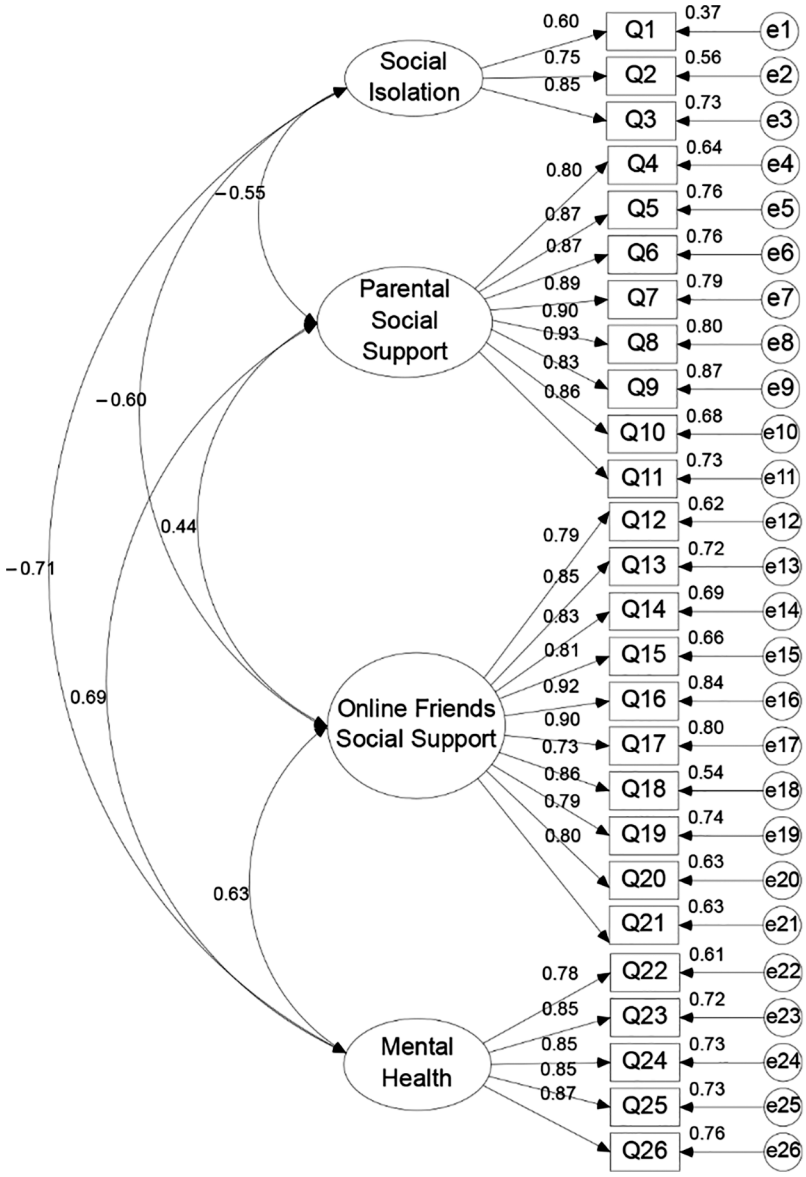

Figure 2: Measurement model

Table 2: The valid item, mean, standardized regression coefficient (SRC), and *t* value in social isolation (Q1 to Q3), parental social support (Q4 to Q11), online friends social support (Q12 to Q21) and mental health (Q22 to Q26)

No.	Questionnaire items	Mean	SD	SRC	*t* value
Q1	I easily connect with others.	2.24	1.27	0.61	9.19***
Q2	I have someone who I can share my feelings with.	2.21	1.14	0.75	7.70***
Q3	I find that I can easily connect with others when I need them.	2.31	1.20	0.85	5.10***
Q4	When I need help, my parents help me analyze the ins and outs and possible reasons.	3.71	1.25	0.80	9.66***

(Continued)

Table 2 (continued)

No.	Questionnaire items	Mean	SD	SRC	*t* value
Q5	My parents make me feel safe and happy.	4.02	1.18	0.87	9.12***
Q6	My parents make me feel that no matter what decision I make, they will support me.	3.82	1.15	0.87	9.16***
Q7	My parents accompany me at dinner, talk to me, or perform other leisure activities with me so as to make me forget my troubles.	3.86	1.21	0.89	8.93***
Q8	My parents listen to me intently when I am describing a situation or specifying my complaints; this makes me feel like they understand me.	3.77	1.24	0.90	8.81***
Q9	My parents encourage me and make me feel that I have to work harder to solve my problems.	3.84	1.22	0.93	7.77***
Q10	My parents give me money or other material assistance when I need help.	3.95	1.14	0.83	9.51***
Q11	My parents need me, and this makes me feel I am important to them.	4.05	1.16	0.86	9.30***
Q12	When I need help, my online friends will help me analyze the ins and outs of things and possible reasons.	3.39	1.19	0.79	9.65***
Q13	My online friends make me feel safe and happy.	3.11	1.27	0.85	9.26***
Q14	Some of my online friends make me feel that no matter what decision I make, they will support me.	3.03	1.24	0.83	9.39***
Q15	Some of my online friends accompany me during entertainment activities, such as playing video games and online chatting, so as to make me forget about my troubles.	3.47	1.25	0.81	9.52***
Q16	Some of my online friends listen to me intently when I am describing a situation or specifying my complaints; this makes me feel like they understand me.	3.22	1.20	0.92	8.18***
Q17	Some of my online friends encourage me and make me feel that I have to work harder to solve my problems.	3.31	1.24	0.90	8.67***
Q18	When I need help, some of my online friends give me money or other material assistance.	2.77	1.32	0.73	9.83***
Q19	Some of my online friends need me, and this makes me feel that I am important.	3.07	1.32	0.86	9.15***
Q20	The Internet allows me to find likeminded friends.	3.19	1.31	0.79	9.62***
Q21	Online friends easily accept me.	3.16	1.28	0.80	9.60***
Q22	I enjoy my life.	3.51	1.31	0.78	9.17***
Q23	I feel that my life is meaningful.	3.92	1.17	0.85	8.44***
Q24	I can concentrate (think, study, and memorize) on what I want to do.	3.69	1.20	0.85	8.36***
Q25	I can accept my physical appearance.	3.71	1.20	0.85	8.35***
Q26	I am satisfied with myself.	3.69	1.18	0.87	8.01***

Note: Items per variable were separated by instruction, which mentioned that the answers were reported under home quarantine. ***$p < 0.001$.

Table 3: The cronbach's alpha, CR, AVE, and correlation matrix in social isolation (SI), parental social support (PSS), online friends social support (OFSS), and mental health (MH)

Variable	Cronbach's alpha	CR	AVE	SI	PSS	OFSS	MH
SI	0.77	0.78	0.55	0.74			
PSS	0.96	0.96	0.76	−0.52	0.87		
OFSS	0.96	0.96	0.69	−0.50	0.43	0.83	
MH	0.92	0.92	0.71	−0.61	0.66	0.59	0.84

Note: The square root of the AVE of variables is shown on the diagonal, and the correlation coefficient of two variables is shown on the below diagonal.

The convergent and discriminate validity, as explained through construct validity, was verified using CFA: the factor loadings were 0.60–0.93 (Fig. 2) and no variance was negative in the parameters [33,34]—all had significant *t* values. Moreover, the model fit indices demonstrated an acceptable fit: $\chi^2 = 994.33$ ($p < 0.001$), $\chi^2/df = 3.39$, RMR = 0.07, SRMR = 0.05, CFI = 0.87, NFI = 0.87, IFI = 0.87, and PNFI = 0.75 [27,30]. Finally, the CR and AVE of all variables were in the range of 0.78–0.96 and from 0.55–0.76, respectively (Table 3). Taken together, the results indicated that the current measurement model has reasonable reliability and convergent validity with internal consistency. Because correlation coefficients of the two variables were less than their corresponding square roots of AVEs (Table 3), the current model also has discriminant validity.

Finally, to reduce the common method variance (CMV) caused by self-reporting during the measurement process, specific instructions for separating variables (e.g., "The following topics are to understand your feelings during quarantine") and the reverse question method were employed for the social isolation items [38]. Moreover, the single factor model containing 26 items demonstrated model fit: $\chi^2 = 2{,}949.69$ ($p < 0.001$), $\chi^2/df = 9.87$, RMR = 0.26, GFI = 0.31, CFI = 0.52, NFI = 0.50, IFI = 0.53, and PNFI = 0.46. Therefore, the results indicated the absence of any serious CMV in the current questionnaire [39].

3 Results

3.1 Moderating Effect

3.1.1 Moderating Effect of Parental Social Support

First, a structural direct effect model was constructed (Fig. 3). Standardized regression coefficients of all items ranged from 0.62 to 0.93; furthermore, the model fit demonstrated that the direct effect model was reasonable for our samples: $\chi^2 = 359.02$ ($p < 0.001$), $\chi^2/df = 3.56$, GFI = 0.83, RMR = 0.06, CFI = 0.92, NFI = 0.89, IFI = 0.92, and PNFI = 0.75 [27,30]. The path coefficients of social isolation ($\gamma = -0.48$, $p < 0.001$) and parental social support ($\gamma = 0.43$, $p < 0.001$) for mental health reached statistical significance (Fig. 3).

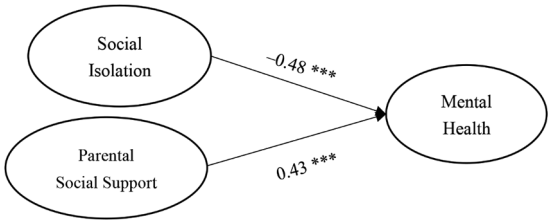

Figure 3: Direct effects of social isolation and parental social support on mental health
Note: ***$p < 0.001$.

Second, for multigroup analysis for the moderating role of parental social support, the mean scores of the scale for social support from parents were divided into high and low social support groups [35–37]. The high social support group demonstrated scores that were above average, indicating that individuals perceived that they can easily obtain mental and physical supports from parents, whereas the low social support group demonstrated contrary results [21]. Consequently, the number of individuals in the high and low social support groups was 117 and 96, respectively.

Third, the default model demonstrated acceptable fit: $\chi^2 = 174.03$ ($p < .001$), $\chi^2/df = 4.58$, GFI = 0.83, RMR = 0.09, CFI = 0.85, NFI = 0.82, IFI = 0.85, and PNFI = 0.55. Moreover, the test model demonstrated reasonable fit: $\chi^2 = 177.29$ ($p < 0.001$), $\chi^2/df = 4.47$, GFI = 0.83, RMR = 0.09, CFI = 0.85, NFI = 0.82, IFI = 0.85, and PNFI = 0.57. However, the fit of these models indicated the default model fit was not visibly superior to that of the test model. Simultaneously, the chi-square difference test confirmed that the fit between the default and test models did not have a significant difference in the chi-square value ($\Delta\chi^2$ (1) = 0.27, $p > 0.05$), thereby indicating that social support from parents did not moderate the social isolation–mental health relationship in the current college students [35,36]. Hypotheses H1 and H2a were accepted, but hypothesis H3a was rejected.

3.1.2 Moderating Effect of Social Support from Online Friends

First, a direct effect model was constructed on the basis of social isolation, social support from online friends, and mental health (Fig. 4); the standardized regression coefficients of all items ranged from 0.62 to 0.92; the model demonstrated a reasonable fit: $\chi^2 = 532.89$ ($p < 0.001$), $\chi^2/df = 4.04$, CFI = 0.88, RMR = 0.07, NFI = 0.85, IFI = 0.88, TLI = 0.86, and PNFI = 0.73 [27,30]. The path coefficients of social isolation ($\gamma = -0.51$, $p < 0.001$) and social support from online friends ($\gamma = 0.33$, $p < 0.001$) on mental health all reached statistical significance (Fig. 4).

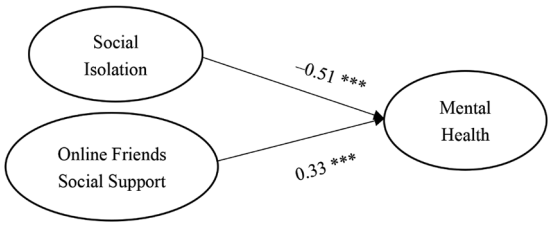

Figure 4: Direct effects of social isolation and online friends social support on mental health
Note: ***$p < 0.001$.

Second, the moderating effect of social support from online friends was confirmed using multigroup analysis, where the number of individuals in the high and low social support groups were 100 and 113, respectively.

Third, the default model demonstrated acceptable fit: $\chi^2 = 151.137$ ($p < 0.001$), $\chi^2/df = 3.98$, GFI = 0.85, RMR = 0.08, CFI = 0.88, NFI = 0.85, IFI = 0.88, and PNFI = 0.58. Moreover, the test model demonstrated reasonable fit: $\chi^2 = 158.55$ ($p < 0.001$), $\chi^2/df = 4.07$, GFI = 0.85, RMR = 0.11, CFI = 0.87, NFI = 0.84, IFI = 0.87, and PNFI = 0.59. These fit indices demonstrated that the fit of the default model was slightly superior to that of the test model. Next, the chi-square difference test revealed a significant difference between the default and test model fit ($\Delta\chi^2$ (1) = 7.42, $p < 0.01$); therefore, social support from online friends moderated the social isolation–mental health relationship in the current college students. Hypotheses H1, H2b, and H3b were accepted.

Fourth, this moderating effect was resolved by path coefficients and t values [35]. Here, in the default model, social isolation in the high ($t = -3.16$, $p < 0.01$) and low ($t = -6.17$, $p < 0.001$) online friends social

support groups negatively and significantly affected mental health (Table 4). However, the level of social support from online friends created a moderating effect in the relationship between social isolation and mental health. In the low social support group, social isolation negatively affected mental health ($\gamma = -0.72$, $p < 0.001$) more strongly than it did in the high social support group ($\gamma = -0.47$, $p < 0.01$).

Table 4: Multi-group analysis in moderating effect of online friends' social support

Type		Default model	Test model
Chi-square value		151.14	158.55
	High score group (*N*)	100	
	Low score group (*N*)	113	
Path coefficient			
	High score group γ (*t*)	−0.47(−3.16**)	−0.64(−7.16***)
	Low score group γ (*t*)	−0.72(−6.17***)	−0.65(−7.16***)

Note: **$p < 0.01$, ***$p < 0.001$.

4 Discussion

Hypotheses H1, H2a, H2b, H3a, and H3b were verified. The results for H1, H2a, and H2b were consistent with those of previous studies—verified on the basis of the direct effect models in this study (Figs. 3 and 4, respectively). Thus, perceived social isolation of home quarantine had a negative effect on the mental health of college students in Hubei [9,10,17], and social support from parents and online friends had a positive effect on the mental health of college students in Hubei [11,22,23]. Furthermore, H3b was accepted, but H3a was rejected. In accordance with the stress buffering theory [15,16], social support from online friends moderated the relationship between perceived social isolation and mental health; however, social support from parents did not. This difference in outcomes demonstrates that social support from online friends may be more important than social support from parents [12,13]. The results of H3b were verified in a multigroup analysis. The high online friends social support group exhibited a relatively weak relationship between perceived social isolation and mental health, whereas the low online friends social support group exhibited a relatively strong relationship between perceived social isolation and mental health.

According to the results of hypotheses H1, H2b, and H3b, this research shows that social support from online friends was essential for the mental health of college students in Hubei who were under home quarantine. The perceived social isolation of home quarantine may result in poor mental health [9,10], possibly because college students in Hubei were quarantined in confined environments for a prolonged period, leading to feelings of anxiety and stress [5,6]. Receiving social support from online friends may act as a stress buffer that helps prevent college students in Hubei from developing poor mental health [13]. The moderating role of social support from online friends in the relationship between social isolation and mental health was shown to be strong. According to stress buffering theory, social support from online friends is considered a stress buffer and facilitates the development of problem-solving strategies [15]. This buffering effect enhanced or reduced adaptation to the circumstances of home quarantine depending on the amount of social support received from online friends [14,15]. Consequently, while under home quarantine, college students who receive sufficient social support from online friends may avoid the negative effect of perceived social isolation on mental health. Furthermore, an absence of sufficient social support from online friends may enhance the negative effect of perceived

social isolation on the mental health of the college students [5–8,17,19]. Therefore, social support from online friends may improve the mental health of college students in Hubei who are under home quarantine.

5 Conclusion

This study revealed that perceived social isolation negatively predicted mental health among college students in Hubei who were under home quarantine during the COVID-19 pandemic. Furthermore, it showed that social support from online friends moderated this relationship: the relationship between perceived social isolation and mental health becomes stronger when social support is more abundant.

5.1 Implications

This study discussed the theoretical interpretation of how social support from online friends moderates the relationship between perceived social isolation and mental health while under home quarantine. This research can help psychological researchers understand the moderating mechanism of social support from online friends and the importance of social support from online friends for the mental health of college students who are under home quarantine.

Home quarantine of people who have had close contact with COVID-19, and especially college students [40], has become a standard policy procedure for reducing the spread of COVID-19 [41]. This study mainly revealed that perceived social isolation of home quarantine negatively predicted the mental health of college students in Hubei [9,10,17]. Social support from online friends was a buffer against deteriorations in mental health among college students in Hubei who were under home quarantine [13]. Receiving sufficient social support from online friends reduced the negative effect of perceived social isolation on mental health, and insufficient social support from online friends enhanced the negative effect of perceived social isolation on mental health [5–8,17,19]. This study makes the following three recommendations to Chinese university staff, counselors, and the government on how to support and preserve the mental health of students who are experiencing the social isolation of home quarantine. First, university staff should establish a team of counselors to provide psychological crisis and intervention support. Second, these counselors should play the role of online friends providing support to college students who are developing poor mental health due to perceiving social isolation while under home quarantine. Finally, the Chinese government should be cautious in implementing epidemic prevention policies such as home quarantine. If social isolation perception increases, young people may be at risk of social withdrawal. Strong social support systems that include parents and social contact through the Internet may help reduce the phenomenon of social withdrawal among young people [42,43]. The Chinese government can refer to other countries when designing epidemic prevention policies.

5.2 Limitations and Future Directions

This study used a relatively small sample, which may be the reason the model fits were not perfect. Future studies should use larger sample sizes, particularly when multiple conditions are to be sampled. The use of quarantines as a pandemic response tool has been expanding in China and also in various other countries; thus, follow-up research on social isolation is warranted.

In this study, the Cronbach's alpha was $\alpha = 0.77$. This could be because this study only used three social isolation measurement items to measure social isolation. Follow-up research on social isolation should consider using more measurement items.

The correlational findings of this study do not imply causation. The findings of this study only explained the potential importance of social support from online friends for the mental health of college students in Hubei who are under home quarantine. The findings of this study can be used as a reference for future research on social isolation.

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