MEDICAL SCIENCE

Authors' Affiliation:
[1]PhD Student of Clinical Psychology, Department of Clinical Psychology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2]PhD of Clinical Psychology, Department of Clinical Psychology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[3]Associate Professor of Clinical Psychology, Department of Clinical Psychology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

*Corresponding author
Associate Professor of Clinical Psychology, Department of Clinical Psychology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran,
Iran
Email: dr.masjediarani@gmail.com
ORCID: 0000-0002-2474-3381

Contact List
Amir Mahdi Katani   amir.katani.1993@gmail.com
Ahmad Yousefi   Ahmadyousefi7676@ gmail.com
Parastoo Naeimijoo   pnaeimijoo1392@ gmail.com
Reza Karimi   rezakarimi127@yahoo.com
Abbas Masjedi Arani   dr.masjediarani@gmail.com

ORCID List
Amir Mahdi Katani   0000-0002-9534-7140
Ahmad Yousefi   0000-0002-9921-3596
Parastoo Naeimijoo   0000-0001-5460-0237
Reza Karimi   0000-0001-9274-4565
Abbas Masjedi Arani   0000-0002-2474-3381

DISCOVERY
SCIENTIFIC SOCIETY

Love and belongingness as a buffer in Covid time: The mediating role of Love Life Satisfaction and Social Connectedness in the relationship between Intolerance of Uncertainty and Well Being (a structural equation modeling approach)

Amir Mahdi Katani[1], Ahmad Yousefi[2], Parastoo Naeimijoo[2], Reza Karimi[2], Abbas Masjedi Arani[3*]

ABSTRACT

Background: Dealing with uncertainties that burst upon us woefully by the pandemic is beyond the capabilities of many individuals, which could adversely affect their psychological status. Being assured that we are not alone in the face of these feelings of unpredictability could help sustain our psychological well-being. Therefore, we centered on the aim of the present study on the role of love life and social connectedness in the relationship between intolerance of uncertainty and psychological well-being (PSW). *Method:* A total of 634 individuals over the age of 20 participated in this cross-sectional study through either an online student or employee's portal or word of mouth. The participants were either students or employees of three universities. The study took place over four months during the time the delta variant spread around the country. The data were analyzed through structural equation modeling using the AMOS software version 22. *Results:* The chi-square-to-freedom ratio index (df / χ^2 =2.64), (RMSEA=0.076), and (SRMR=0.072) along with IFI, CFI, NFI, and RFI confirm the fitness of the model. The data indicated the mediating role of love, life satisfaction, and sense of social connectedness in the relationship between intolerance of uncertainty and psychological well-being. *Conclusion:* The present study's findings reveal that a sense of affiliation and belongingness could be viewed as a fundamental and rich resource in human experience during critical

periods. This warrants community intervention and family/couple relationship development in an extensive setting.

1. INTRODUCTION

Even two years since the onset of Covid-19, the globe is still in the grip of this pandemic. The current Coronavirus-19 epidemic, with its spiking rate of mortality, not only led to physical and economic tolls WTO, (2020), but also caused emotional scars and psychological suffering (Qiu et al., 2020; Jiang et al., 2020). Many people experience anxiety, fear, and worry in the midst of this stressful phenomenon (Mertens et al., 2020; Ahorsu et al., 2020). However, the nature of its unpredictability adds to the stress of the situation. The non-clarity of the concern regarding controlling the pandemic, the probability of being infected, uncertainty on the effectiveness of prevention procedures, the extent of the seriousness of the disease for a given person Seco-Ferreira et al., (2020), fear of loss of loved ones Cao et al., (2020), skepticism about the vaccination effectiveness and time of this pestilence eradication from the planet puts an uncertain scenario ahead of us. This may characterize the Covid-19 pandemic as a particularly challenging issue, threatening psychological well-being (PSW) (Satici et al., 2022).

PSW is a concise psychological concept that covers constructs including optimism, hope, coping, happiness, and life satisfaction (Camfield et al., 2009; Gillison et al., 2008; Ryff, 1989). Feelings of uncertainty have been frequently reported to be associated with negative PSW in several studies (Satici et al., 2022; Mufti et al., 2022; Goto et al., 2006; Mustafa et al., 2016). Understandably, during this time, people may experience anger, frustration, and boredom over the uncertainty when life returns to normal (Cao et al., 2020). Prior research shows that pandemics threaten many indices of PWB, in which intolerance to uncertainty (IU) is an important determinant (Satici et al., 2022). Currently, people are isolated within fixed spaces for long periods of time and have limited access to family and friends. Social distancing quickly leads people to feel disconnected from the world and lose their mental health and wellbeing (WB) (Finsterwalder et al., 2020).

It is well established that one of contributing factors to WB is social connectedness (SC) with research showing consistent links to psychological health (Baumeister and Leary, 1995; Oishi et al., 2009; Kansky, 2018; Lamarche, 2020). Prior research has shown that people with low connectedness often experience low self-esteem, anxiety, and depression (Lee and Robbins, 1998). SC is a delineation of an internal sense of belonging and closeness within an individual's social world, including relationships with friends, family, peers, and so on. Thus, the absence of an SC indicates difficulty in relationships with the social world (Capanna et al., 2013). While social ties could be vital in acquiring and maintaining PSW, emotional knots and romantic relationships also uniquely and powerfully contribute to this mental construct (Kansky, 2018). A strand of studies has shown not just the mere existence of romance but that relationship satisfaction is responsible for PSW (Galinha et al., 2014; Campbell et al., 2005; Myers, 2000).

However, stressors brought on by the recent Covid-19 hamper relationship quality. Pandemic studies have explored the role of romantic partners' responsiveness and quality of relationship buffers against stressors induced by pandemic sequelae. As retaining a satisfying romantic relationship plays a central role in the overall WB Balzarini et al., (2020), human mental health may be hit hard during the outbreak among individuals lacking emotional romance satisfaction. Given the accumulating evidence of the adverse effect of IU on PSW, and the crucial effect of SC on psychological health, and regarding the research highlighting the role of these constructs on PSW, we hypothesize that romantic relationship satisfaction and an inner sense of connectedness may mediate the effect of IU on PWB in the context of the Covid-19 pandemic (Figure 1).
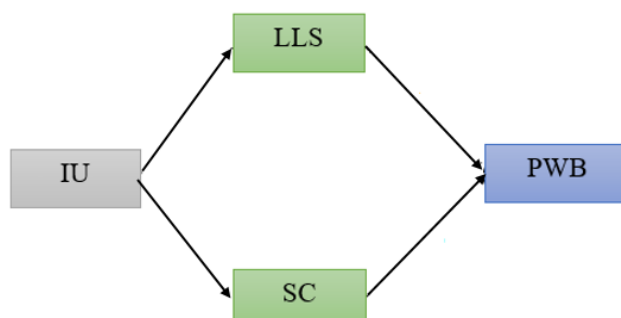

Figure 1 Conceptual model of mediation of love life satisfaction (LLS) and social connectedness (SC) between uncertainty (IU) and psychological wellbeing (PWB)

2. MATERIALS AND METHOD

Design, participants, and procedure

978 participants above 20 years old were recruited via convenience sampling to participate in this study. Participants were recruited from employers and students of "Shahid Beheshti University of Medical Sciences", "University of Science and Technology", and "Kharazmi university" Kharazmi University of Tehran. Recruitment into the study occurred online and through word-of-mouth. The questionnaires were delivered either through an alert on their employees' or students' portals, or paper questionnaires. Given our research question focusing on Love life, only the questionnaires of those participants who were currently in a relationship were selected for analysis (289 removed), leaving 689; of these, 55 participants were removed from the sample for insufficient completion, leaving a final sample of 634 participants for analysis. The survey initiated on June 26th to and ceased September 22nd 2022, during which the Delta variant spread spiked and the country went through four weeks of intermittent compulsory lockdowns.

Measurements

Participant Information

Participants indicated their age, gender, educational status, marital status, length of relationship, and whether they had a child upon completion of the questionnaire.

Intolerance Study of Uncertainty (IU)

To assess IU, the *Intolerance of Uncertainty Scale (IUS)* Freeston et al., (1994), which is a Likert-type scale composed of a 27-item, with five anchors per item, was used. Each item presents a belief statement and participants must indicate using the 5-point scale the level to which they regard the statement as "characteristic of me". Scoring for each item ranged from 1 ("is not characteristic of me at all") to 5 ("entirely characteristic of me"). The total score on the scale ranged from 27 to 135. The IUS has proper internal consistency (a=0.91) and reliability evidence in English (r=0.78) Buhr and Dugas, (2002) and Persian version (0.79) (Ebrahimzade, 2006).

Love Life Satisfaction (LLS)

The Relationship Assessment Scale (RAS) was used to collect data on satisfaction with romantic relationships. RAS is a 7-item Likert scale that assesses general satisfaction, how well the partner meets someone's needs, how well the relationship is compared to others, regrets about the relationship, how well one's expectations have been met, love for the partner, and problems in the relationship. The average rating on a 5-point scale for these seven items was used as the endorsement of satisfaction with romantic relationships for those in love. The scale's internal consistency was shown to be (a=0.86) (Hendrick et al., 1998; Hendrick, 1988).

Social Connectedness (SC)

For the aim of capturing the degree to which an individual senses closeness with the social world, we used *revised Social Connectedness Scale (SCS-R)* created by (Lee et al., 2001). The scale has 20 items answered using a 6-point Likert-type scale ranging from "1 (strongly agree) to 6 (strongly disagree). A high score indicated a strong sense of closeness with the social world. The findings show that the SCS psychometrically sounds good, with reliability and high internal consistency (0.92) Lee et al., (2001) and test-retest reliability (0.87) (Chen and Chung, 2007).

Psychological Well-Being (PSW)

The study employed the short questionnaire 5-item World Health Organization Well-Being Index (WHO-5), which encompasses five noninvasive and simple questions targeting the psychological well-being of the individual. Respondents were asked to report their accordance with each statement on 5 point-Likert scale considering the suitability of the scale's statements with their psychological condition during the last 14 days. Each item score ranges from 5 to 0 (all of the times not at all) (Topp et al., 2015). Favorable psychometric properties in different samples (a=0.87) Awata et al., (2007), Saipanish et al., (2009) and Iranian populations (a=0.94) Khosravi et al., (2015) have been demonstrated for the scale.

3. RESULTS

Demographic characteristics

A total of 634 respondents (M age = 35.37, SD = 4.51) participated in the survey. Participants were predominantly female (57%), while male composition was 43%, and predominantly graduated with a bachelor's degree (56%). The majority of the participants were romantically attached (dating: 44%), and most of them did not have children (70%). Participants had been in a relationship (either married, engaged, or dating) for an average of 30 months (months = 29.84, SD = 7.62) (Table 1).

Table 1 Demographic characteristics

Variables		Frequency	Percent
Sex	Male	271	42.75
	Female	363	57.25
Education level	Diploma	31	4.88
	Upper Diploma	73	11.52
	Bachelor	356	56.15
	Master	136	21.45
	Ph.D.	38	5.99
Relationship Status	Dating	278	43.85
	Engaged	102	16.09
	Married	254	40.07
Having Child	Yes	193	30.44
	No	441	69.56
		Mean	SD
Age		35.37	4.51
Length of Relationship Based on month		29.84	7.62

Correlational analysis

The means, standard deviations, and correlation coefficients between the research variables, are presented in (Table 2).

Structural Equation Modeling

As can be seen in Table 2, there are significant negative relationships between IU and PWB, LLS, and SC, and a significant positive relationship between other variables. The research hypothesis for running the structural equation model is that IU indirectly predicts PWB with the mediating role of LLS and SC. The statistical power and adequacy of the sample size for path analysis were calculated using the KMO test to model the structural equation. The size of this test is between 0 and 1, so that a value of 0.7 and higher confirms the adequacy of the sample size and the statistical power of path analysis and extraction of regression coefficients. The sizes of the KMO indices for the research variables are presented in (Table 3).

Table 2 Descriptive statistic and correlation matrix of predictor variables with psychological well-being

	Mean	SD	IU	LLS	SC
PSW	73.69	8.75	-0.22**	0.16**	0.11**
IU	74.26	12.42	-	-0.17**	0.09*
LLS	23.81	5.41	-	-	0.10**
SC	81.32	9.43	-	-	-
** is significant at the 0.01 level, * is significant at the 0.05 level.					
PSW: Psychological Well-Being					
IU: Intolerance of Uncertainty					
LLS: Love Life Satisfaction					
SC: Social Connectedness					

Table 3 Evaluation of statistical power and sample adequacy using KMO test

Variables	KMO	

PSW	0.83	KMO > 0.7
IU	0.76	KMO > 0.7
LLS	0.79	KMO > 0.7
SC	0.73	KMO > 0.7
KMO > 0.7: The statistical power and adequacy of the sample are confirmed. PSW: Psychological Well-Being IU: Intolerance of Uncertainty LLS: Love Life Satisfaction SC: Social Connectedness		

In the next step, the hypothetical model of the research was examined by structural equation modeling using the AMOS software version 22. A model diagram and regression coefficients are shown in (Figure 2).
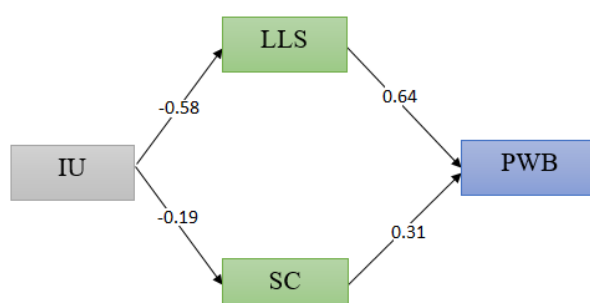

Figure 2 The path coefficients of the structural equation model of the research variables; love life satisfaction (LLS), social connectedness (SC), between uncertainty (IU), psychological wellbeing (PWB).

As shown in Figure 2, the significance of all model path coefficients was confirmed using a t-test. To evaluate the adequacy of the model fit, the following goodness-of-fit indices were used: The chi squared ($v2$) test, incremental fit index (IFI), Relative Fit Index (RFI), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), and normed fit index (NFI).

Table 4 Summary statistics of structural equation modeling

	Acceptable domain	Observed value	Goodness of fit
df/χ^2	3 ≥	2.64	appropriate
IFI	0.9 <	0.94	appropriate
RFI	0.9 <	0.91	appropriate
RMSEA	0.08 >	0.076	appropriate
SRMR	0.08 >	0.072	appropriate
CFI	0.9 <	0.91	appropriate
NFI	0.9 <	0.93	appropriate
N=634 IFI: Incremental Fit Index; RFI: Relative Fit Index; RMSEA: Root Mean Square Error of Approximation SRMR: Standardized Root Mean Square Residual; CFI: Comparative Fit Index; NFI: Normed Fit Index			

The Chi-square-to-freedom ratio index (df / χ^2), which is less than 3, confirms that the model fits the data (Table 4). Moreover, the root mean square error (RMSEA) was 0.076, and the standardized root mean square error (SRMR) was 0.072, both of which were less than the criterion (0.08), confirming model fitness. Finally, being above the desired criterion (0.9), the IFI, CFI, NFI, and RFI

indices also show goodness of fit. In general, considering the sum of the calculated fit indices, the goodness of the predictive path analysis model of the PWB was based on IU, LLS, and SC. Moreover, the fitted model showed that IU can indirectly predict PWB through the mediation of LLS and SC.

4. DISCUSSION

The unpredictable and stressful nature of the Covid era has caused a great deal of psychological suffering due to uncertainties in the pandemic time, yet the effects of this turmoil on human PSW come in many forms. Recognizing the characteristics that make some people resilient to this stressful period and others fragile is of great importance. In the present study, we aimed to identify explanatory factors. In general, parallel with our hypothesis (Figure 1), this study's findings indicate the mediating role of LLS and SC in the relationship between IU and PSW during the Covid-19 pandemic (Figure 2). These results yielded a strong prediction of LLS in PSW. The direct path between LLS and PSW is in line with many previous studies showing the relationship between love and subjective WB Galinha et al., (2014), and those studies introducing love as a predictor of happiness and life satisfaction (Diener and Biswas-Diener, 2008).

The data also showed that not simply being in a relationship account for the link but also the quality of the relationship. This finding is in line with previous studies showing that a rich supportive romantic relationship is a robust predictor of PWB during outbreaks (Pietromonaco and Collins, 2017). It is well established that marriage and romantic relationships prior to marriage are linked to lower psychological distress and higher WB (Diener et al., 2000). Perhaps various blessings associated with love, such as the exchange of positive emotions, two-sided care, emotional contacts, sex, and kissing, may contribute to the happiness included in PSW. The findings also revealed a direct relationship between IU and LLS, reflecting previous longitudinal studies that introduced stress as the main source of lower relationship quality (Neff and Karney, 2017).

This is justifiable, as a high level of IU brings about a level of stress that could wear out one's energy needed to be invested in the relationship and disrupt essential coping mechanisms; hence, the individual engages in more negative communication patterns that could cause discord. This outcome relates to past research suggesting that couples with prolonged stress are at greater risk of relationship dissatisfaction and conflict (Karney et al., 2005). A noteworthy part of our findings is that LLS appeared as a mediator in the relationship between IU and PSW; having a satisfying relationship and a sense of belonging is like a shield against unpleasant feelings of uncertainty. This means that relationship satisfaction might be important to maintain PSW, notwithstanding the level of IU related to COVID and its squeal, whereas a low-quality relationship can indeed erode and exacerbate PSW when facing uncertainties regarding COVID.

The findings corroborate previous work demonstrating that partner responsiveness is a buffer against covid 19 stressors (Balzarini et al., 2020). Love and marriage satisfaction with the support and security of mind they have, provide a safe haven for the individual while, on the other hand, failure to maintain intimacy and emotional proximity with a partner may burn out the mental world. Thus, supportive partners are the primary source of comfort when encountering Covid-19 uncertainties and internal stressors. Sensing intimacy and satisfying relationships may promote better coping and bring about inner peace and solace. When people face internal or external stressors, the main coping strategy seems to be to turn to partners and have a relationship with protection, understanding, and reassurance that, even in the case of chaos, the partner is supportive, and a strong reliable pillar could cause a feeling of safety and mitigate stress during stress.

In addition to LLS, SC has also been found to be positively correlated with PSW as well as predicting PSW which implies that SC could serve as a buffer against adverse effects of uncertainties on PWB. This is in line with recent pandemic research showing the cruciality of SC in health and well-being, suggesting that increased SC could help ease an individual's anxiety in the face of trauma, including the global pandemic (Nitschke et al., 2021). This outcome indicates that we need to rely on each other to promote PWB. When people are faced with a spillover of internal turmoil, the SC is important to mitigate the inner disturbances imposed by Covid 19 stressors. The findings of the study provided evidence confirming previous research indicating that SC supports people when encountering negative emotions, such as distress and worry, particularly in this period replete with adversity and uncertainty (Zaki and Williams, 2013).

In accordance with this, another study showed that a higher sense of connectedness is associated with lower Covid-19-specific worries (Nitschke et al., 2021). Our data also mirror the theoretical viewpoint, postulating that increased SC is generally related to a decrease in distress (Eisenberger, 2012). This is because when individuals respond to their need for belonging and affiliation, they develop a secure, stable sense of comfort and confidence, which could subside many internal worries. This is true for a person who is less capable of tolerating the uncertainties of Covid time. However, a sense of detachment from community members, family, and

friends could intensify internal disturbances, as in a sample of the Dutch Population, less social connectedness was related to greater anxious states during the Covid-19 pandemic (Eisenberger, 2012).

This is congruent with the finding that a sense of cohesion with community members contributes to quality-of-life Williams et al., (2020) and mental WB (Snyder-Mackler et al., 2020). This also builds on laboratory stress studies showing that social proximity results in stress-induced cortisol responses Heinrichs et al., (2003) associated with brain regions responsible for processing threatening situations Eisenberger et al., (2007), such as pandemic-induced situations. Our findings indicate that SC and LLS may play an important role in alleviating distress during the COVID-19 pandemic and its unprecedented nature, approving the catalytic role of affiliation issues in human life. The mediating role of LLS and SC is indicative that even in the presence of many stressors, even those that are out of human controllability, having a sense of belongingness and assurance of the presence of beloved protective ones around us may bring protection.

Limitation and direction for future research

The findings of this study suggest recommendations for future studies based on the following limitations. One of the possible limitations of our study was the lack of clinical measurements of psychopathologies to obtain PWB scores. This could be a key component of future research to assess PWB with regard to the presence or absence of psychopathologies such as depression or anxiety disorders. Another limitation of the research might be that we only targeted the existence of romantic relations without including different love styles, while previous studies have shown that PSW could be associated differently with different love styles (Kim and Hatfield, 2004). Current and future treatment strategies may benefit from this issue. One additional limitation is the cross-sectional nature of the study. Although the study duration could be construed as a strong aspect, the duration of the relationship could positively or adversely affect PWB encountering stress. Thus, it would be beneficial to conduct research examining separate time series from the onset of a romantic relationship.

5. CONCLUSION

We then discuss the theoretical and practical implications of our findings. On a theoretical basis, our findings revealed the importance of attending to the underlying mechanisms contributing to PSW. In addition, regarding the important role of relationships and connections and their role in improving the capacity to face adversities, policymakers and mental health specialists' efforts should be to preserve and promote strong bonds by targeting affiliation goals with an emphasis on family and couple relationships. Furthermore, pinpointing frictions and inharmony in social relations to motivate cohesion should be on the government's agenda, particularly during traumatic events such as pandemics.

Authors' contribution

Conceptualization, Ahmad Yousefi; Methodology and Formal analysis, Ahmad Yousefi, Reza Karimi; Investigation, Resources, Ahmad Yousefi, Parastoo Naeimijoo; Data collection, Mostafa Heidari; Writing and original draft preparation, Parastoo Naeimijoo; review and editing, Ahmad Yousefi, Parastoo Naeimijoo; Supervision, Maryam Bakhtiyari; Project administration, Abbas Masjedi Arani. All authors have read and agreed to the published version of the manuscript.

Ethical approval

Ethics approval was obtained from the Research Ethics Committees of Vice-Chancellor of Research Affairs, Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1399.1038). The questionnaires were displayed only after participants accepted the conditions and agreed to participate. All participants voluntarily responded to the anonymous research and provided informed consent within the survey. The purpose of this study has been explained clearly. The respondents provided explicit consent for the information they provided to be used for study purposes.

Conflict of interest

The authors declare that there is no conflict of interest.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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