

Turkish Adaptation of the Psychological Strain Scale in a Non-Clinical Sample of Emerging Adults

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Abstract

Suicidal behavior is a severe global health problem. For the period of emerging adulthood in particular, it represents the second-leading cause of death, followed by unintentional injuries. Therefore, there is an urgent need to develop and diversify the methods and tools that can detect the factors that make individuals vulnerable to experiencing suicidal thoughts. Strain Theory of Suicide (STS), which aims to explain socio-psychological agencies preceding suicidal behavior, hypothesizes that opposing and rivaling pressures coming from four sources (i.e., value, aspiration, deprivation, and coping) lead to suicidal behavior. In light of the premises offered by the STS, the present study aimed to adapt the Psychological Strain Scale (PSS) in Turkish and test its psychometric properties in a non-clinical sample of emerging adults. Participants were emerging adults whose ages ranged between 18 and 29. The survey package consisting of the Depression, Anxiety, and Stress Scale, Psychological Strain Scale, Suicide Probability Scale, Rosenberg Self-Esteem Scale, and Marlowe-Crowne Social Desirability Scale was filled out by 398 emerging adults (60.05% of women). Construct, concurrent, and discriminant validity evidence was ensured by exploring the factor structure of the instrument through Confirmatory Factor Analysis (CFA) and by investigating the relationship between the scores obtained from PSS and other criterion measures. The results of CFA indicated an adequate fit, $\chi^2/df = 2.14$, CFI = .92, TLI = .91, SRMR = .05, AGFI = .85, RMSEA = .05. Reliability evidence was ensured by the internal consistency method, Cronbach alphas scores were found as .81, .88, .89 and .83 for the subscales of value, aspiration, deprivation and coping, respectively. Multigroup analysis indicated that the factor structure of the PSS was invariant across gender. The results of psychometric testing offered tangible evidence for the usefulness of the PSS as a measure of vulnerability to suicidal thoughts among emerging adults.

Keywords: suicide, psychological strain, validity, reliability, Türkiye.

Psikolojik Gerilim Ölçeğinin Klinik Olmayan Beliren Yetişkinlik Örneklemine Türkçe Uyarlaması

Öz

İntihar davranışı ciddi bir küresel sağlık sorunudur. İntihar, beliren yetişkinlik dönemindeki ölüm sebepleri arasında kasıtsız yaralanmaları takiben ikinci sırada yer almaktadır. Bu nedenle, bireyleri intihar düşüncelerine yatkın hale getiren faktörleri tespit edebilecek yöntem ve araçların geliştirilmesine ve çeşitlendirilmesine önemle ihtiyaç duyulmaktadır. İntihar davranışlarına sebep olan sosyo-psikolojik yapıları açıklamayı amaçlayan İntihar Gerilim Kuramı (İGK), dört kaynaktan ortaya çıkan (değer, istek, yoksunluk, baş etme), karşıt ve birbiriyle çekişme halinde olan zorlanma durumlarının intihar davranışına sebep olduğunu varsaymaktadır. Bu çalışmanın amacı, İGK'nin temel sayıltılarını temel alarak Psikolojik Gerilim Ölçeğini (PGÖ) Türkçeye uyarlamak ve ölçeğin psikometrik özelliklerini klinik olmayan beliren yetişkin örneklemine test etmektir. Çalışmanın katılımcıları, 18 ile 29 yaş arasında yer alan beliren yetişkinlerdir. Depresyon, Anksiyete ve Stres Ölçeği, Psikolojik Gerilim Ölçeği, İntihar Olasılığı Ölçeği, Rosenberg Benlik Saygısı Ölçeği ve Marlowe-Crowne Sosyal Arzuedilebilirlik Ölçeği'nden oluşan anket paketi 398 beliren yetişkin (60.05 kadın) tarafından doldurulmuştur. Yapı, eş zamanlı ve ayırt edici geçerlilik kanıtları, Doğrulamalı Faktör Analizi (DFA) ve PGÖ'den elde edilen puanlar ile diğer ölçüt değişkenler arasındaki ilişkinin saptanması yollarıyla sağlanmıştır. DFA sonuçları uyum değerlerinin yeterli olduğunu işaret etmektedir ($\chi^2/df = 2.14$, CFI = .92, TLI = .91, SRMR = .05, AGFI = .85, RMSEA = .05). Güvenirlik kanıtı ise iç tutarlık yöntemi ile sağlanmış olup Cronbach alfa katsayıları değer, istek, yoksunluk ve baş etme alt boyutları için sırasıyla .81, .88, .89 ve .83 olarak bulunmuştur. Çoklu grup analizi sonucunda PGÖ'nün faktör yapısının cinsiyete göre farklılık göstermediği belirlenmiştir. Ölçeğin psikometrik özelliklerine ilişkin sonuçlar, PGÖ'nün beliren yetişkinler arasında intihar düşüncelerine yatkınlığı ölçmede kullanılabilirliğine dair kanıtlar sunmaktadır.

Anahtar kelimeler: intihar, psikolojik gerilim, geçerlik, güvenilirlik, Türkiye.

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INTRODUCTION

Suicide is a public health problem that results in one million annual casualties. The incidence of suicide rates has undergone a significant increase of 36% over the past two decades (World Health Organization, [WHO], 2021). Moreover, because of the social stigma related to the topic of suicide, it is assumed that these numbers are underestimated (Bilsen, 2018; Katz et al., 2014). It is estimated that each completed suicide affects almost 135 individuals including families and friends (Cerel et al., 2018). Given that the number of completed suicides is predicted around 800.000 worldwide (WHO, 2021), a rough estimation of one hundred million individuals affected by suicide points to the severity of this public health problem across the globe. In Türkiye, a completed suicide occurs on an average of every two hours, and crude suicide rates showed an increasing trend of 3.61 in 2011 vs. 4.88 in 2022 (TÜİK, 2023). According to Franklin et al. (2017), although the quantity of research aiming to enhance the understanding of suicide has tended to pile up, it seems that suicide rates have undergone an unprecedented rise across the world over the past several decades (Martinez-Ales et al., 2020) with slight declines in the years of 2019 and 2020 (Centers for Disease Control and Prevention [CDC], 2021). What is more, although completed suicides occur in all regions of the world, almost three-quarters (77%) of completed suicides occurred in low and middle-income countries (LMIC) in the year 2019 (WHO, 2021), and Türkiye was reported to be one of the LMIC countries as of 2023 (The World Bank, 2023).

Suicide ideation-also referred to as suicidal thoughts (Zhang, 2017)-and suicide attempts are thought to be the phenotypes (DiBlasi, 2021). Although suicide ideation is one of the prominent predictors of completed suicides (Victor & Klonsky, 2014), most of the individuals who have suicide ideation do not engage in a serious attempt (Klonsky, 2021). That is, suicidal behavior can be conceptualized as a spectrum, pointing out the proposition that suicide ideation and attempts entail distinctive interpretations (Klonsky & May, 2014). This point calls for a need to learn the topic of suicide ideation before making progress toward understanding completed suicides. Therefore, to enhance our comprehension of suicidality and suicide prevention, the initial focus should be directed at understanding what makes individuals more vulnerable to experiencing suicidal thoughts (Klonsky, 2021).

Thus far, several theories and models have attempted to explain why people engage in suicidal behavior. According to Durkheim (1897/2005), a core component of completed suicides is low social integration, meaning that an individual who feels more connected to society and experiences a sense of belonging, they are less likely to commit suicide. According to the interpersonal-psychological theory of suicide (Joiner, 2015), suicide ideation and completed suicides require two different explanations: the former occurs when the concomitant presence of thwarted belongingness and perceived burdensomeness is maintained, and only if those two are accompanied by the fearlessness about death and increased capacity to experiencing physical pain, then completed suicides occur. The integrated motivational-volitional model proposed by O'Connor (2018) expands upon the interpersonal-psychological theory of suicide and asserts that feelings of defeat and entrapment result in suicide ideation and the progression from suicide ideation to suicidal action is reinforced by such volitional agents as impulsivity, access to means/tools, and physical pain sensitivity. However, according to Zhang (2016), these theories failed to elucidate the process through which a lack of integration/social disconnection occurs or what would be the potential preceding factors leading to pain and hopelessness within the individual.

Developed by Zhang (2016), the Strain Theory of Suicide (STS) proposes that psychological strains arising from four sources give rise to suicidal behavior. Strain refers to at least two opposing forces that drive or tug individuals in different directions (Zhang, 2019), which, in return, creates feelings of frustration, fury, and uneasiness. As a result, the magnitude of the strain becomes so beyond all bearing that the individual engages in suicidality to find a solution to reduce or terminate the devastating effect of this strain (Zhang & Lester, 2008; Zhang, 2016). While strains seem to be similar to cognitive dissonance, the influence of the strains is hypothesized to be more devastating (Zhang, 2016). As hypothesized and statistically demonstrated by Zhang et al. (2022), strain is a psychological structure consisting of four sources. *Value strain* surfaces when two anomalous but equally significant social values conflict with each other; *aspiration strain* emerges as a consequence of the misalignment among aspirations and the actual situation an individual lives in; *deprivation strain*, which may go hand in hand with poverty and social exclusion, refers to a perceived condition where individuals feel like other people with similar background maintain a better life compared to them; *coping strain* refers to a limited set of coping abilities when confronted with a life crisis (Sun & Zhang, 2016; Zhang, 2016).

To date, empirical findings regarding the effect of psychological strains on mental health and suicidality have yielded notable results across various samples and contexts. For instance, Zhang et al. (2017a) concluded that psychological strains were associated with suicidal thoughts in samples consisting of American and Chinese college students and there were no significant differences in terms of the scores in four types of strains. In another

study, it was found that coping strain and value strain were found to be related to suicide ideation among medical staff and non-medical staff, respectively. Psychological strains were also related to suicide intent in a sample of suicide attempters (Zhang et al., 2017b) and to several mental health outcomes such as depression and anxiety (Zhang & Lyu, 2014; Zhang et al., 2013; Zhang & Tao, 2013). In terms of the relevance of STS in completed suicides, notable results indicating significant associations were reported (Zhang & Lester, 2008; Zhang et al., 2009) and it was concluded that psychological strains were able to differentiate completed suicides from suicide attempts (Lyu et al. 2020). Though the majority of the empirical results were ensured within Chinese and US contexts, one study conducted with a large sample ($n = 173,664$) of Norwegian adolescents concluded that psychological strains were relevant constructs in predicting adolescent suicidality, though the strength of the relationships was not promising (Haghish et al., 2024). In a study carried out in Norway, psychological strains were revealed to be significant predictors of completed suicides resulting from gambling (Selin & Lind, 2023). Lastly, in the adaptation study of the PSS into Russian, it was found that all four sources of strains were predictors of suicidal tendencies, and three out of four subscales were able to differentiate clinical vs. non-clinical samples (Chistopolskaya et al., 2023).

In sum, the PSS appears to be a valuable instrument for recognizing psychological strains and clinically related constructs including anxiety, depression, and suicide ideation. Within the scope of the current study, through the adaptation process, the objective was to investigate the psychometric properties of the PSS in a Turkish sample of emerging adults. For this purpose, initially, the factor structure of the scale was explored through Confirmatory Factor Analysis (CFA), followed by examining reliability evidence through the internal consistency method. To ensure concurrent validity, correlations between the PSS and its subscales, and depression, anxiety, stress, suicidal thoughts, and self-esteem were calculated. For discriminant validity evidence, the correlation between the scores obtained via the PSS and its sub-dimensions, and social desirability were examined. An attempt to confirm the psychometric features of the PSS in a Turkish sample holds a significant value for the field of suicide research in Türkiye. Given that suicide has a multi-faceted and comprehensive nature and as it is of utmost importance to develop techniques for screening individuals who exhibit behaviors within the spectrum of suicidality (Babeva et al., 2016; King et al., 2018), this study, ultimately, aims to enrich the existing measurement tools which were hypothesized to be precursors of suicidality. Moreover, to the researchers' knowledge, there is no reported instrument used for measuring the psychological strains in the Turkish population. Correspondingly, this study was expected to enrich the cross-cultural applicability of the PSS. Therefore, we hypothesized that the Turkish version of PSS would yield satisfactory psychometric properties.

METHOD

Research Design

The purpose of the study was to adapt and test the psychometric properties of the PSS in a sample of Turkish emerging adults. Therefore, the correlational research design, defined as “the degree to which two or more quantitative variables are related through correlation coefficient” (Fraenkel et al., 2012, p.331), was used to inspect relationships among study variables.

Participants

The recruitment procedure included one eligibility criterion of being 18-29 years of age, which was hypothesized to correspond to the period of emerging adulthood in the context of Türkiye (Atak & Çok, 2010). In total, 398 participants, of whom 240 (60.3%) were female and 158 (39.7) were male, filled out the instruments. The ages of the participants varied between 18 and 29 ($M = 22.69$, $SD = 3.24$). An overwhelming majority of the participants stated that they did not work in a job where they generated income ($n = 311$, 78.14%). In terms of the latest degrees graduated, 222 (55.78%) individuals stated that they graduated from university, 152 of them graduated from high school (38.19%), and 23 (5.78%) individuals graduated from a masters/Ph.D., and lastly, 1 individual (0.25%) graduated from middle school, which seems to be depicting a highly educated profile. In terms of participants' perceived socio-economic status, most of them reported ($n = 229$, 57.5%) that they belong to the ‘middle income’ category among the five categories. As for participants' religious affiliation, 354 (88.9%) participants indicated that they believe in a religion. The results of demographic information regarding the sample are shown in Table 1.

Table 1. Participants' Demographic Characteristics (n = 398)

	Variables	f	%
Gender	Male	158	39.7
	Female	240	60.3
Latest degree graduated	Middle school	1	0.3
	High school	152	38.2
	Bachelor's	222	55.8
	Postgraduate	23	5.8
Employment status	Working	87	21.9
	Not working	311	78.1
Socioeconomic status	Lower	29	7.3
	Lower-middle	91	22.9
	Middle	229	57.5
	Upper-middle	2	0.5
	Upper	47	11.8
Religious affiliation	Yes	354	88.9
	No	44	11.1

Procedure

After receiving permission to adapt the PSS from English to Turkish from Dr. Zhang, the study protocol was confirmed by the Middle East Technical University Human Subjects Ethics Committee. An online data collection and convenience sampling method was used to reach potential participants. A survey package was created by the researchers to be shared with both the close circle of the researchers and social media applications, including Instagram, Facebook, and WhatsApp. The participants who were disposed to attend were provided a Google Forms link where they could reach the survey package (i.e., Google Forms link). On average, it took 15 minutes to complete the survey. Before filling out the surveys, the purpose of the study was explained, and the e-mail address of the first author was shared in the case of a request for information about the results of the study. The ethical issues of anonymity and confidentiality were underlined, and they were reminded that they could drop out of the study at any point they desired. Since participants were asked questions about current suicidal thoughts, it was emphasized that the researchers do not provide any sort of mental health service, and it was made clear that the researchers would not be able to contact them even if the participant had active suicide ideation. Instead, some of the phone numbers or website information about the institutions where they can receive support or help were made available to them.

Instruments

Psychological Strain Scale (PSS)

Developed by Zhang and Lyu (2014), the PSS aims to measure psychological strains, defined as a state of tension characterized by the existence of a minimum of two stressors, in which the individual either is pulled or pushed toward different directions (Zhang et al., 2014). Those strains, in return, hypothetically lead to an increase in suicidal thoughts. PSS is a 5-point Likert-type scale where 1 and 5 refer to 'Never' and 'Yes', respectively. Higher scores obtained from the scale point out greater tension or strain experienced. The scale consisted of four dimensions each having 10 items: value strain (e.g., *"I am often confused about what life means to me."*), aspiration strain (e.g., *"I wish I could change my current living condition, but I cannot"*), deprivation strain (e.g., *"Compared to other people in my neighborhood, I am a poor person."*), and coping strain (e.g., *"When I have difficulties in what I am doing, I usually give up the task."*). In the original study, the reliability coefficient was calculated through Cronbach's alpha, and it was found to be .94 for the total scale and ranged between .80 and .87 for the subscales. Additional reliability evidence was ensured by obtaining the Guttman Split-half correlation coefficient which was found to be .84 for the total scale, and between .72 and .81 for the subscales. Validity evidence of original PSS was obtained through exploratory factor analysis and the correlation between psychological strains and anxiety, depression, and suicide ideation. Based on Cohen's (1988) criterion, significant and medium-to-large correlations between anxiety and value ($r = .49, p < .01$), aspiration ($r = .48, p < .01$), deprivation ($r = .48, p < .01$), and coping strains ($r = .63, p < .01$) were obtained. In a similar vein, significant associations between depression and value ($r = .48, p < .01$), aspiration ($r = .48, p < .01$), deprivation ($r = .41, p < .01$), and coping strains ($r = .54, p < .01$) were also reported. Along with that, all four sources of strains predicted

suicidal behaviors. In addition, it was concluded that the PSS scores were able to differentiate the symptom group from the non-symptom group, indicating that discriminant validity was also ensured. The items for the PSS are presented in Appendix B.

The Adaptation Process of the PSS

In the current study, during the adaptation process, a well-established forward translation-back translation method was used. Initially, a 40-item scale was translated from English to Turkish by three scholars from the major of Psychological Counseling and Guidance who had proficiency in English and Turkish. Following that, translated versions of the items were comparatively assessed, and the items that represented the most proper meaning in grammar and cultural appropriateness were selected. Then, one academician from the field of Psychological Counseling and Guidance back-translated the scale items into English. The researchers cross-checked the back-translated and original items, and it was concluded that there were no disparities in terms of meaning. Two lecturers with a Ph.D. degree in American Culture and Literature and English Language and Literature were requested to provide feedback in terms of grammar, clarity, and intelligibility. Based on the feedback received from language experts, several minor changes were made. A lecturer with an ongoing Ph.D. in Turkish Literature provided feedback for the translated items regarding grammar, punctuation, subject-verb appropriateness, and singular-plural forms of the words. As the last procedure, cognitive interviews were conducted. Nine individuals who fulfilled the recruitment criterion were kindly requested to read the items loudly and provide feedback to explore the cognitive processes they engage in while responding to survey items. Based on the interviewees' reports in terms of wording and meaning, some small changes were made, and the Turkish version of the PSS was finalized.

Depression, Anxiety, Stress Scale Short Form (DASS-21)

Originally developed by Henry and Crawford (2005), DASS-21 is a 21-item instrument aiming to measure negative emotional states (i.e., depression, anxiety, and stress). The names of the subscales and sample items were as follows; depression ("*I couldn't seem to experience any positive feeling at all.*"), anxiety ("*I felt I was close to panic*") and stress ("*I found it hard to wind down.*") and each dimension has 7 items. DASS-21 is a 4-point Likert-type scale where 0 represents *not appropriate for me* and 3 refers to *very appropriate for me*. The minimum and maximum scores obtained from the DASS were 0 and 63, respectively. Higher scores refer to higher levels of depression, anxiety, and stress. The reliability evidence was ensured through Cronbach's alpha where it was found to range from .88 to .90 for subscales and .93 for the total scale.

DASS-21 was adapted to Turkish by Yılmaz et al. (2017). A 21-item and 3-dimension structure was maintained in the Turkish version as well. For reliability evidence, Cronbach's alpha coefficients were calculated, and they were found to range from .76 to .82 for the subscales. The evidence of validity was ensured through confirmatory factor analysis, which yielded satisfactory results.

Rosenberg Self-Esteem Scale (RSE)

RSE was developed by Rosenberg (1979) to measure the level of self-esteem. The original version was a 4-point Likert-type scale (1=strongly disagree, 4=strongly agree) with half of the items to be reversely coded. The original RSE consisted of 10 items and one dimension. A sample item for the RSE is "*I feel that I have a number of good qualities.*" Reliability evidence of the RSE was ensured through the Guttman split-half correlation coefficient, which was found to be .92. The test-retest reliability coefficient was .88. The higher scores obtained from the scales refer to higher levels of self-esteem. The minimum and maximum scores obtained from the RSE were 10 and 40.

The Turkish adaptation study of RSE was conducted by Çuhadaroglu (1986). Similar to the original RSE, it is a 10-item and 4-point Likert-type where 1 and 4 correspond to *absolutely false* and *absolutely true*, respectively. Reliability evidence was provided by calculating Cronbach's alpha coefficient and test-retest correlation coefficient, which were found to be .77 and .71, respectively. Validity evidence was obtained through exploratory factor analysis.

Suicide Probability Scale (SPS)-Suicidal Thoughts Subscale (ST)

Originally developed by Cull and Gill (1990), SPS was developed to evaluate suicide risk among individuals 13 years or older. Respondents express the frequency with which each statement relates to them on a

4-point rating scale where 1 indicates “None or a little of the time” and 4 corresponds to “Most or all of the time”. The total scores obtained from the scale refer to risk or probability score and higher scores reflect higher levels of suicide risk. The minimum and maximum scores obtained from the scale are 46 and 144. SPS consists of 36 items and four dimensions: hopelessness (“*I feel I can’t be happy no matter where I am*”), suicide ideation (“*In order to punish others I think of suicide*”), negative self-evaluation (“*I feel many people care for me deeply*”), and hostility (“*When I get mad, I throw things*”). The internal consistency was measured through Cronbach alpha and test-retest methods, which were found as .92 and .93, respectively. For the current study, only the dimension of *suicide ideation* was used.

The Turkish adaptation of SPS was carried out by Eskin (1993). The reliability evidence was provided by calculating Cronbach’s alpha coefficient, and it was found .87 for the total scale and .85 for the subscale of ST. For validity evidence, the negative and strong correlations between SPS including its four subscales and perceived social support from family ($r = -.75, p < .01$) and friends ($r = -.60, p < .01$) were obtained.

Marlowe-Crowne Social Desirability Scale (MCSDS)

Developed by Crowne and Marlowe (1960), the purpose of MCSDS was to measure the levels of social desirability. The original MCSDS consists of 33 binary (yes or no) items. Validity evidence was ensured by another measure of social desirability (i.e., Edwards Social Desirability Scale). The reliability evidence was obtained by calculating the Kuder-Richardson score and found as .88.

Ural and Özbirecikli (2006) adapted the short form of the MCSDS to Turkish. Compared to the original version which has 33 binary items, the short form of the MCSDS is a 6-point Likert-type scale consisting of a total of 7 items where 1 refers to *strongly agree* and 6 corresponds to *strongly disagree*. The results of exploratory factor analysis pointed out a one-factor structure and reliability evidence was ensured by Cronbach’s alpha, which was found as .78. Sample item for the short form of MCSDS is “*Admit it when make a mistake*”. Higher scores obtained from the scale refer to higher social desirability (i.e., higher need for social approval). The minimum and maximum scores obtained from the scale are 7 and 42, respectively.

Data Analysis

First up, a data screening procedure was applied and 3 unengaged responses together with the 10 participants who were outside of the age criterion were removed from the dataset. Following that, using SPSS Version 21, descriptive statistics were employed to depict a clearer picture of the sample studied. Then, to examine the construct validity of the Turkish PSS, a CFA was conducted by using AMOS 21 (Arbuckle, 2012). While evaluating the model, several fit indices were calculated and suggested threshold values were as follows based on Kline’s (2005) criteria; χ^2/df -ratio (<3), comparative fit index ($>.90$), Tucker-Lewis index ($>.90$), the root mean square error of approximation ($<.08$), the adjusted goodness of fit index ($>.80$), standardized root mean square residual ($<.10$). Using correlation coefficients based on Cohen’s (1988) criteria (.10, .30 and .50 represent small, medium and large effects, respectively) DASS-21, RSE, SPS-ST were utilized to maintain convergent validity and MCSDS were applied to ensure discriminant validity of the Turkish PSS.

FINDINGS

Construct Validity of the PSS

Before commencing the CFA procedure, several assumptions including minimum sample size based on Tabachnick and Fidell’s (2003) criteria of $N > 50 + 8m$ (N : number of participants, m : number of independent variables), normality based on Kline’s (2011) criteria of skewness and kurtosis values between +3 and -3 (the highest values were .56 and -.86), outliers based on Tabachnick and Fidell’s (2003) criteria of Z-scores ranging between +3.29 and -3.29, multicollinearity based on Kline’s (2011) criteria of bivariate correlations among study variables lower than .85 (it was between .47 and .65), linearity based on visual inspection of bivariate scatterplots were checked, and no violation was found except for multivariate normality based on Mardia’s (1985) test, which yielded a multivariate kurtosis score of 261.38, $p < .01$. To eliminate its detrimental effects (Byrne, 2016), a bootstrapping procedure with 1000 samples (95% *CI*) was applied. Additionally, the items that factor loadings below .50 were removed based on Hair et al.’s (2019) criterion. Therefore, 8 items were removed from the dataset. Additionally, 3 error covariances (e22-e23, e21-e22, e20-e21) were freed for the items that were theoretically related, as guided through modification indices. In sum, the hypothesized model satisfactorily fit the data ($\chi^2/df =$

2.14, CFI = .92, TLI = .91, SRMR = .05, AGFI = .85, RMSEA = .05). Additionally, second-order CFA was conducted to explore whether obtaining a total score is possible and the results were adequate, ($\chi^2/df = 2.21$, CFI = .91, TLI = .90, SRMR = .06, AGFI = .84, RMSEA = .06). The factor loadings ranged from .52 to .83. The proposed cutoff values and fit index values in the hypothesized model was provided in Table 2. The results of the second-order CFA are shown in Appendix A.

Table 2. Proposed Cutoff Values and Fit Index Values in the Hypothesized Model

Model fit index	Proposed cutoff value	Fit index value in the hypothesized model (first order)	Fit index value in the hypothesized model (second order)
Absolute fit index			
X ² /df ratio	X ² /df < 3 (Kline, 2011)	2.14	2.21
SRMR	SRMR < .05 (Byrne, 2016)	.05	.06
Incremental fit index			
CFI	CFI > .90 (Schumacker & Lomax, 2010)	.92	.91
TLI/NNFI	TLI > .90 (Byrne, 2016)	.91	.90
AGFI	AGFI > .80 (Baumgartner & Homburg, 1996)	.85	.84
Parsimony-adjusted fit index			
RMSEA	.05 < RMSEA < .08 for close fit (Schumacker & Lomax, 2010)	.05	.06

In sum, similar to the original version, the four-factor structure of the PSS was confirmed. The PSS comprised a total of 32 items and the subscales were *value* (7 items), *aspiration* (9 items), *deprivation* (9 items), and *coping* (7 items). The measurement invariance across gender was tested by following Cheung and Rensvold's (2002) criteria of fitness indicator difference test and it was revealed that model invariance across gender was maintained. The proposed model for first-order CFA is shown in Figure 1.

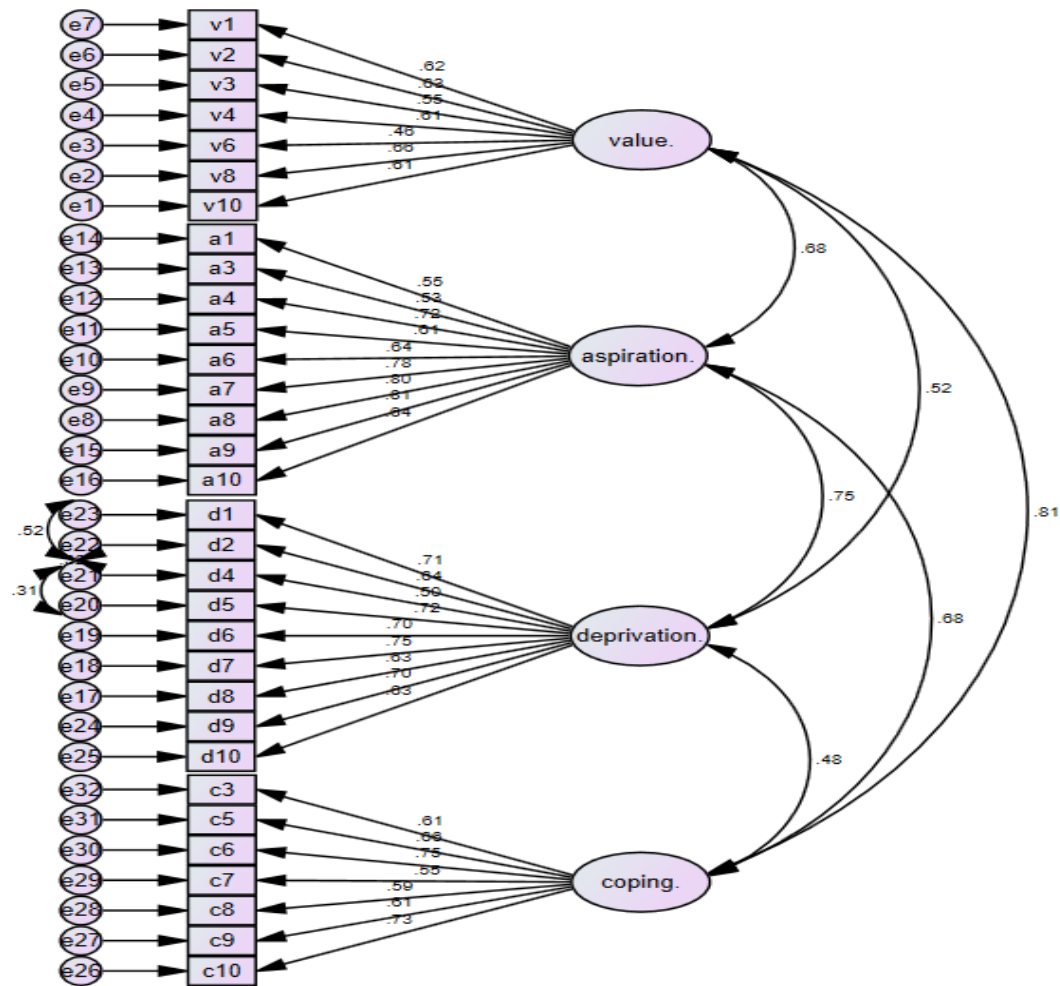


Figure 1. The result of confirmatory factor analysis of the psychological strain scale

Reliability, Convergent, and Discriminant Validity of the PSS

For the reliability evidence, two internal consistency methods (i.e., Cronbach's alpha and Mc Donald's omega) were utilized. Cronbach's alpha coefficients for the *value*, *aspiration*, *deprivation*, and *coping* subscales were .81, .88, .89, and .83, respectively. For the same order, Mc Donald's Omega coefficients were found as .80, .88, .87, and .83. In terms of convergent validity, psychological strains were positively and significantly correlated with anxiety ($r = .59, p < .01$), depression ($r = .69, p < .01$), stress ($r = .63, p < .01$), and suicidal thoughts ($r = .56, p < .01$) while negatively associated with self-esteem ($r = -.62, p < .01$). As hypothesized, discriminant validity results demonstrated a non-significant association between psychological strains and social desirability ($r = .01, p > .05$). The results of correlation analyses for convergent and discriminant validity evidence are presented in Table 2. In sum, the psychometric properties of the Turkish PSS were found to be satisfactory in the current study sample.

Table 2. The Results of Correlation Analysis for Convergent and Discriminant Validity Evidence for the PSS

	Anxiety	Depression	Stress	Self-Esteem	Suicidal thoughts	Social desirability
Value strain	.54*	.60*	.54*	-.54*	.45*	.03
Aspiration strain	.51*	.62*	.57*	-.50*	.52*	.03
Deprivation strain	.37*	.46*	.41*	-.40*	.42*	-.07
Coping strain	.57*	.61*	.58*	-.57*	.43*	.04
Total strain	.59*	.69*	.63*	-.62*	.56*	.01

*Note. $p < .01$

DISCUSSION & CONCLUSION

The findings of the present study have the potential to enlarge the current understanding of suicide in several ways. The Strain Theory of Suicide (STS), a recently developed conceptual framework, intends to elucidate the motivation behind suicidal behavior and as well as mental health conditions. Based on the premises of STS, social structures and how individuals react to those structures prime the onset of suicidal behavior (Zhang et al., 2014). The purpose of the study was to adapt the English version of the Psychological Strains Scale (Zhang & Lyu, 2014) into Turkish and test its psychometric properties in a sample of emerging adults residing in Türkiye. Similar to the original version, the four-factor structure was maintained although loadings of the several items were found to be below the threshold value, which resulted in the exclusion of those items.

The excluded two items in *value strain* which are ‘I don’t know if women have the same rights as men’, and ‘Between chastity and sexual liberty, I don’t know what I should do’ were the items that yielded the lowest mean scores and standard deviations, which implies that participants reported relatively uniform replies and that the discriminative power regarding those items is low. Therefore, it appears that those items were not able to differentiate the ones that exhibit higher value strain from the ones having lower value strain. The other item ‘I am not living the way I want, and I feel bad about it,’ was loaded on the hypothesized dimension, but the factor loading was not satisfactory. In Zhang et al.’s (2022) study where psychometric characteristics of the PSS were tested, it was found that the same item was cross-loaded, yet it was decided to retain it as the factor loading was satisfactory. In the current study, although it was not cross-loaded, the factor loading was found to be insufficient. Likewise, in the Russian version of the PSS, the first two items excluded yielded low factor loadings, and the last item was cross-loaded (Chistopoloskaya et al., 2023). Furthermore, the two excluding items within the subscale of *coping strain* were ‘I cannot handle too many things at the same time’ and ‘I am always to do things as I like, without thinking of the consequence’. It seems that almost 70% of the participants replied either ‘1-definitely disagree’ or ‘2-disagree’ to those two items, which reflect the lower levels of distinctiveness of those items in the context of Türkiye. The other excluded item belonging to the coping subscale was ‘Face is so important to me that I will do everything to protect my public image, even suicide’, which yielded the lowest mean score and variance among all items in the same subscale. One alternative explanation could be related to the sample characteristics as it reflected the characteristics of emerging adults who are non-clinical and believe in a religion. Therefore, using the word ‘suicide’ explicitly might have exacerbated the stigma existing in Muslim-majority countries (Shoib et al., 2022), or the word “suicide” itself might not have resonated with the non-clinical population as well. As for the items excluded from *aspiration* and *deprivation* subscales, which were ‘I wish I were living in a better family, but I cannot realize it according to some reasons’ and ‘I believe I am good enough, but I am not satisfied with the treatment from others’, the presence of “double-barreled” statements (Dillman et al., 2004) might have increased complexity of that particular item, resulting in weak factor loadings.

The PSS was developed to measure psychological strains that hypothetically precede suicidal thoughts. The usability and relevance of the PSS for the suicidality spectrum, including suicidal thoughts, attempts, and completed suicides, were proved in different samples. In the current study, findings demonstrated that each source of psychological strain was strongly associated with suicidal thoughts. Following that, the total scores obtained from the Turkish PSS were strongly and positively related to depression, anxiety, and stress and negatively associated with self-esteem, indicating that convergent validity evidence was ensured. A non-significant relationship between psychological strains and social desirability provided initial proof of discriminant validity. To prove construct validity evidence, both first-order and second-order CFAs were conducted, and the results were satisfactory as the proposed model fit the data. Reliability evidence was ensured through internal consistency methods, and it was revealed that the Turkish PSS yields reliable scores in the current sample studied. Moreover, the factor structure of the scale did not change across genders, as proved by measurement invariance analysis.

It appears that the subscale of *deprivation*, which refers to the situation where individuals make comparisons in terms of economic conditions and conclude that they experience relative deprivation, yielded the highest reliability coefficient and factor loadings. As can be speculated, it might be possible that apart from other sources of strain, economic considerations hold greater potential to make individuals more vulnerable to suicidal thoughts in the context of Türkiye.

It is known that economic conditions play a crucial part in increases in suicide rates. For instance, there was a noticeable increase in suicide rates in Türkiye during times of economic recession and crisis (i.e., 2001) (TÜİK, 2023). Due to the impact of the COVID-19 pandemic, Türkiye was reported to be one of the countries where the poverty rate was subject to a gradual increase (The World Bank, 2023). As a result, such detrimental effects stemming from increased poverty rates and/or deprivation strain as limited access to mental health services,

and financial instability leading to feelings of hopelessness, helplessness, and depression might be more closely related to suicidal thoughts when compared to other sources of strain. On the other hand, *value strain*, which refers to the tension or conflict resulting from holding two inconsistent values or notions, yielded the lowest reliability coefficient and factor loading scores. One reason might be related to the items in value strain representing controversial aspects such as virginity or practicing sexual freedom. Value can be defined as “what is desirable within a culture” (Spates, as cited in Fisher & Katz, 2000). In Türkiye, sexuality is often considered taboo, and talking about it is a sin or creates feelings of shame among both men and women (Bakır & Avcı, 2023; Evcili & Gölbaşı, 2019). Therefore, the items in the *value* subscale might have suffered from personal presuppositions, ultimately resulting in relatively lower mean scores (i.e., strongly disagree) and variability. Furthermore, asking sensitive questions including sexuality, might lead to misreporting and receiving inaccurate answers, which is a type of measurement error (Yan, 2021). In a similar vein, in the Russian form of the PSS, most of the items within the *value* subscale were replied to in an ambiguous way, which resulted in low mean scores and weak factor loadings and, therefore, were removed from the scale (Chistopoloskaya et al., 2023).

According to the results of the current study, four sources of strains were significantly associated with each other, similar to the theory and empirical results (e.g., Zhang et al., 2011; Zhang & Zhao, 2017). In an adaptation study from English to Russian (i.e., Chistopoloskaya et al., 2023), the PSS was concluded to have acceptable psychometric features, and the overall scale consisted of 29 items, whereas the PSS has 31 items in the Turkish version. Interestingly, in the Russian version, the *deprivation* subscale was reported as “less informative”, contrary to our result that the same subscale yielded the highest factor loadings and reliability coefficient. One explanation regarding this discrepancy could be that the relative deprivation (e.g., economic considerations leading to the emergence of psychological strains) might have resonated more with the emerging adults living in Türkiye as poverty rates have become subject to a gradual increase as opposed to relative stability in poverty rate Russia (The World Bank, 2023). Another possible explanation could be related to the sample characteristics. In the Russian version, the data were collected from college students, while in the Turkish version, the data were collected from emerging adults. The relative deprivation (i.e., the effects of economic inequality) was thought to be more dominant during emerging adulthood (Lilly et al., 2023) as this transitional period is characterized by founding new social ties, seeking educational opportunities, and establishing a family, which demands financial responsibility (Arnett, 2000).

Implications

This research has important implications for guiding theory, research, and practice as well. The Strain Theory of Suicide (STS) is a relatively contemporary theoretical perspective aiming to account for suicidality among divergent populations. Based on STS, via obtaining promising results in terms of validity and reliability, it was demonstrated that the PSS has satisfactory psychometric properties, which can be reframed as a significant theoretical contribution to the field in terms of applicability, relevance, and adequacy of STS within the context of Türkiye. In addition, this study points out the relevance of psychological strains as a potential treatment target for reducing the severity of suicidal thoughts. Therefore, specific counseling interventions aiming to reduce psychological strains stemming from four areas (i.e., value, aspiration, deprivation, coping), including but not limited to cognitive reframing, value clarification, and coping skills can be applied. Moreover, it is of utmost importance to develop techniques for screening individuals who exhibit behaviors within the spectrum of suicidality (Babeva et al., 2016; King et al., 2018). Therefore, in terms of practice, adapting the PSS to Turkish increased the number of tools that can be utilized while working with suicidal individuals.

Limitations, Future Directions, and Conclusions

Despite notable results regarding the applicability of the PSS in the context of Türkiye and among emerging adults, certain limitations are worth delving into. One major shortcoming of the current study related to the sampling method utilized, as the convenience sampling method restricts the generalizability of the findings. In addition, as the cross-sectional design was used, drawing cause-and-effect conclusions was not possible even though robust correlations among study variables were obtained. Consequently, as self-report measures voluntarily were utilized, only the individuals having access to the internet were able to be reached. The sample studied consisted of emerging adults who were mainly religious believers, women, belonged to the middle socioeconomic class, represented a highly educated profile, and did not work in a job where they generate income. Those demographic characteristics partly limit the generalizability of the results.

Within the scope of the current study, we obtained tangible evidence regarding the usability of the PSS in Turkish emerging adults, which fills a substantial gap in the literature. As mentioned, the PSS aims to measure psychological strains that hypothetically precede suicidal thoughts (Zhang, 2016) and it was concluded that proposed strains are predictors of suicidality and have the power to differentiate the clinical (i.e., having active suicide ideation) and non-clinical samples (Zhang & Lyu, 2014). Further studies might consider investigating whether the Turkish version of PSS enables making such a differentiation. Practitioners can utilize PSS as an additional measure to be used in the process of risk assessment. Researchers could also benefit from the results as it is an attempt to enrich the theoretical framework of the strain theory of suicide by concluding that the Turkish PSS has sound psychometric properties to be utilized among Turkish emerging adults. Additionally, while conducting sessions with suicidal individuals, a typical safety plan should include an evaluation of several risk factors (Stanley & Brown, 2012). Therefore, PSS might be used as a supplementary tool while formulating suicide safety plans. In terms of demographics, further empirical examinations might consider increasing diversity in terms of socioeconomic status, educational attainment, employment status, religiosity, and gender. Suicide is a global health problem, but it especially comes to a boil in particular developmental periods and emerging adulthood is one of those delicate intervals. Future studies might consider the inclusion of other delicate periods such as young adulthood and adolescence. Lastly, further longitudinal studies are needed to establish causal associations.

Statements of Publication Ethics

We declare that we obeyed the principles of publication ethics. This research was approved by the Middle East Technical University Human Subjects Ethics Committee (0334-ODTÜİAEK-2022).

Researchers' Contribution Rate

Authors	Literature review	Method	Data Collection	Data Analysis	Results	Conclusion
Berkan Demir	☑	☑	☑	☑	☑	☑
Zeynep Hatipoğlu Sümer	☑	☑	☐	☐	☑	☑

Conflict of Interest

We have no conflict of interest to disclose.

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REFERENCES

- Atak, H., & Çok, F. (2010). İnsan yaşamında yeni bir dönem: Beliren yetişkinlik [A new period in human life: Emerging adulthood]. *Journal of Childhood and Adolescence Mental Health*, 17(1), 39-50.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480. <https://doi.org/10.1037/0003-066X.55.5.469>
- Babeva, K., Hughes, J. L., & Asarnow, J. (2016). Emergency department screening for suicide and mental health risk. *Current Psychiatry Reports*, 18(11), 100. <https://doi.org/10.1007/s11920-016-0738-6>
- Bakır, A. & Haskan-Avcı, Ö. (2023). *The cultural closet: Masculinity tested by sexuality in Turkey* [Paper presentation]. 6th International Conference on Gender Research, 20-21 April, Derry-Londonderry, Northern Ireland.
- Baumgartner, H., & Homburg, C. (1996). Applications of structural equation modeling in marketing and consumer research: A review. *International Journal of Research in Marketing*, 13(2), 139–161. [https://doi.org/10.1016/0167-8116\(95\)00038](https://doi.org/10.1016/0167-8116(95)00038).

- Bilsen, J. (2018). Suicide and youth: Risk factors. *Frontiers in Psychiatry*, 9, 540. <https://doi.org/10.3389/fpsy.2018.00540>
- Borges, G., Angst, J., Nock, M. K., Ruscio, A. M., & Kessler, R. C. (2008). Risk factors for the incidence and persistence of suicide-related outcomes: A 10-year follow-up study using the National Comorbidity Surveys. *Journal of Affective Disorders*, 105(1–3), 25–33. <https://doi.org/10.1016/j.jad.2007.01.036>.
- Centers for Disease Control and Prevention [CDC] (2021). *Suicide prevention*. <https://www.cdc.gov/suicide/index.html>.
- Cerel, J., Brown, M. M., Maple, M., Singleton, M., van de Venne, J., Moore, M., & Flaherty, C. (2019). How many people are exposed to suicide? Not six. *Suicide & Life-Threatening Behavior*, 49(2), 529–534. <https://doi.org/10.1111/sltb.12450>
- Cheung, G.W. & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233–255. https://doi.org/10.1207/S15328007SEM0902_5
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.
- Crosby, A. E., Han, B., Ortega, L. A., Parks, S. E., Gfroerer, J., & Centers for Disease Control and Prevention [CDC] (2011). Suicidal thoughts and behaviors among adults aged ≥18 years--United States, 2008–2009. *Morbidity and Mortality Weekly Report. Surveillance Summaries (Washington, D.C.: 2002)*, 60(13), 1–22.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24(4), 349–354. <https://doi.org/10.1037/h0047358>
- Çuhadaroğlu, Ö. (1986). Adolesanlarda benlik saygısı [Self-esteem in adolescents]. [Unpublished doctoral dissertation], Hacettepe University.
- Cull, J. G. & Gill, W. S. (1982). *Suicide probability scale (SPS)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t01198-000>
- DiBlasi, E., Kang, J., & Docherty, A. R. (2021). Genetic contributions to suicidal thoughts and behaviors. *Psychological Medicine*, 51(13), 2148–2155. <https://doi.org/10.1017/S0033291721001720>
- Durkheim, E. (2005). *Suicide: A study in sociology* (Spaulding, J. A. & Simpson, G., Trans). Taylor & Francis. (Original work published in 1897).
- Eskin, M. (1999). Gender and cultural differences in the 12-month prevalence of suicidal thoughts and attempts in Swedish and Turkish adolescents. *Journal of Gender, Culture, and Health* 4, 187–200. <https://doi.org/10.1023/A:1023277231880>.
- Evcili, F., & Gölbaşı, Z. (2019). The effect of peer education model on sexual myths of Turkish university students: An interventional study. *Perspectives in Psychiatric Care*, 55(2), 239–248. <https://doi.org/10.1111/ppc.12344>
- Fisher, R. & Katz, J. (2000). Social desirability bias and the validity of self-reported values. *Psychology & Marketing*, 17(2), 105–120. [https://doi.org/10.1002/\(SICI\)1520-6793\(200002\)17:2<105::AID-MAR3>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1520-6793(200002)17:2<105::AID-MAR3>3.0.CO;2-9)
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education*. McGraw-Hill Education.
- Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., Musacchio, K. M., Jaroszewski, A. C., Chang, B. P., & Nock, M. K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin*, 143(2), 187–232. <https://doi.org/10.1037/bul0000084>
- Haghighi, E.F., Nes, R.B., Obaidi, M., Qin, P., Stanicke, L. I., Bekkhus, M., Laeng, B. & Czajkowski, N. (2024). Unveiling adolescent suicidality: Holistic analysis of protective and risk factors using multiple machine learning algorithms. *Journal of Youth Adolescence*, 53(3), 507–525. <https://doi.org/10.1007/s10964-023-01892-6>
- Hair, J. F., Babin, B. J., Black, W. C. & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.

- Henry, J. D. & Crawford, J. R. (2005). The short-form version of the depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, 44(2), 227–239. <https://doi.org/10.1348/014466505X29657>
- Joiner, T. E. (2005). *Why people die by suicide*. Harvard University Press.
- Katz, C., Bolton, J., & Sareen, J. (2016). The prevalence rates of suicide are likely underestimated worldwide: Why it matters. *Social Psychiatry and Psychiatric Epidemiology*, 51(1), 125–127. <https://doi.org/10.1007/s00127-015-1158-3>
- King, C. A., Arango, A., & Ewell Foster, C. (2018). Emerging trends in adolescent suicide prevention research. *Current Opinion in Psychology*, 22, 89–94. <https://doi.org/10.1016/j.copsyc.2017.08.037>
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). Guilford Press.
- Klonsky, E. D., & May, A. M. (2014). Differentiating suicide attempters from suicide ideators: A critical frontier for suicidology research. *Suicide & Life-Threatening Behavior*, 44(1), 1–5. <https://doi.org/10.1111/sltb.12068>
- Klonsky, E. D., Dixon-Luinenburg, T., & May, A. M. (2021). The critical distinction between suicidal ideation and suicide attempts. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 20(3), 439–441. <https://doi.org/10.1002/wps.20909>
- Lilly, K. J., Sibley, C. G., & Osborne, D. (2023). Perceived relative deprivation across the adult lifespan: an examination of aging and cohort effects. *Personality and Social Psychology Bulletin*, 0(0). <https://doi.org/10.1177/01461672231195332>
- Liu, Y., Zhang, J., Hennessy, D. A., Zhao, S., & Ji, H. (2019). Psychological strains, depressive symptoms, and suicidal ideation among medical and non-medical staff in urban China. *Journal of Affective Disorders*, 245, 22–27. <https://doi.org/10.1016/j.jad.2018.10.111>
- Lyu, J., Zhang, J. & Sun, L. (2020). Stronger psychological strains increase the odds of suicide death: A comparison between suicides and suicide attempters. *Comprehensive Psychiatry*, 103(5). <https://doi.org/10.1016/j.comppsy.2020.152205>
- Martinez-Ales, G., Hernandez-Calle, D., Khaul, N., & Keyes, K. M. (2020). Why are suicide rates increasing in the United States? Towards a multilevel reimagining of suicide prevention. *Current Topics in Behavioral Neurosciences*, 46, 1–23. https://doi.org/10.1007/7854_2020_158
- O'Connor, R. C. & Kirtley, O. J. (2018). The integrated motivational–volitional model of suicidal behaviour. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 373(1754). <https://doi.org/10.1098/rstb.2017.0268>
- Rosenfield, S., & Smith, D. (2009). Gender and mental health: Do men and women have different amounts or types of problems? In T. Scheid & T. Brown (Eds.), *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems* (pp. 256–267). Cambridge University Press. <https://doi.org/10.1017/CBO9780511984945.017>
- Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd ed.). Routledge.
- Selin, J. & Lind, K. (2023). Gambling, social integration and sources of strain in cases of suicide: Exploring police investigation reports. *Addiction Research & Theory*. <https://doi.org/10.1080/16066359.2023.2224965>
- Shoib, S., Armiya'u, A. Y., Nahidi, M., Arif, N., & Saeed, F. (2022). Suicide in Muslim world and way forward. *Health Science Reports*, 5(4), e665. <https://doi.org/10.1002/hsr2.665>
- Stanley, B., & Brown, G. K. (2012). Safety planning intervention: A brief intervention to mitigate suicide risk. *Cognitive and Behavioral Practice*, 19(2), 256–264. <https://doi.org/10.1016/j.cbpra.2011.01.001>
- Sun, L., & Zhang, J. (2016). Psychological strains and suicidal intent: An empirical study to relate the two psychopathological variables. *The Journal of Nervous and Mental Disease*, 204(11), 855–860. <https://doi.org/10.1097/NMD.0000000000000529>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*. (6th ed.). Pearson/Allyn & Bacon.

- The World Bank (2023). *Poverty & equality brief: Europe & Central Asia, Türkiye, April 2023*. https://databankfiles.worldbank.org/public/ddpext_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/current/Global_POVEQ_TUR.pdf
- Türkiye İstatistik Kurumu [TÜİK]. (2023). *İntihar İstatistikleri* [Suicide statistics]. <https://data.tuik.gov.tr/Search/Search?text=intihar&dil=1>
- Ural, T & Özbirecikli, M. (2006). Is ethical judgement influenced by social desirability in responding? An analyse on Turkish accountants. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 15(1), 393-410.
- Victor, S. E., & Klonsky, E. D. (2014). Correlates of suicide attempts among self-injurers: A meta-analysis. *Clinical Psychology Review*, 34(4), 282–297. <https://doi.org/10.1016/j.cpr.2014.03.005>
- World Health Organization (2021). *Suicide worldwide in 2019: Global health estimates*. World Health Organization. <https://www.who.int/publications/i/item/9789240026643>
- Yan, T. (2021). Consequences of asking sensitive questions in surveys. *Annual Reviews of Statistics and Its Applications*, 8(1), 109-127. <https://doi.org/10.1146/annurev-statistics-040720-033353>
- Yılmaz, Ö., Boz, H. & Arslan, A. (2017). Depresyon anksiyete stres ölçeğinin (DASS-21) Türkçe kısa formunun geçerlilik-güvenilirlik çalışması [The validity and reliability of depression stress and anxiety scale (DASS-21) Turkish short form]. *Finans Ekonomi ve Sosyal Araştırmalar Dergisi*, 2(2), 78-91.
- Zhang, J. (2012). A strain theory of suicide. In A. Shrivastava, M. Kimbrell, & D. Lester (Eds.), *Suicide from a global perspective: Psychosocial Perspectives* (pp. 119–125). Nova Science.
- Zhang, J. (2016). From psychological strain to disconnectedness. *Crisis*, 37(3), 169–175. <https://doi.org/10.1027/0227-5910/a000420>
- Zhang, J. (2019). The strain theory of suicide. *Journal of Pacific Rim Psychology*, 13, Article e27. <https://doi.org/10.1017/prp.2019.19>
- Zhang, J. & Lester, D. (2008) Psychological tensions found in suicide notes: A test for the strain theory of suicide. *Archives of Suicide Research*, 12(1), 67-73. <https://doi.org/10.1080/13811110701800962>
- Zhang, J., & Lyu, J. (2014). Reliability, validity and preliminary hypothesis tests for the English version of the Psychological strain scales (PSS). *Journal of Affective Disorders*, 164, 69–75. <https://doi.org/10.1016/j.jad.2014.04.011>
- Zhang, J., & Tao, M. (2013). Relative deprivation and psychopathology of Chinese college students. *Journal of Affective Disorders*, 150(3), 903–907. <https://doi.org/10.1016/j.jad.2013.05.013>
- Zhang, J., Dong, N., Delprino, R., & Zhou, L. (2009). Psychological strains found from in-depth interviews with 105 Chinese rural youth suicides. *Archives of Suicide Research*, 13(2), 185–194. <https://doi.org/10.1080/13811110902835155>
- Zhang, J., Kong, Y., Gao, Q., & Li, Z. (2013). When aspiration fails: A study of its effect on mental disorder and suicide risk. *Journal of Affective Disorders*, 151(1), 243–247. <https://doi.org/10.1016/j.jad.2013.05.092>
- Zhang, J., Liu, Y., & Sun, L. (2017a). Psychological strain and suicidal ideation: A comparison between Chinese and US college students. *Psychiatry Research*, 255, 256-262. <https://doi.org/10.1016/j.psychres.2017.05.046>
- Zhang, J., Liu, Y., & Sun, L. (2017b). Life satisfaction and degree of suicide intent: A test of the strain theory of suicide. *Comprehensive Psychiatry*, 74, 1–8. <https://doi.org/10.1016/j.comppsy.2016.12.002>
- Zhang, J., Wang, W., Huen, J. M. Y., Lyu, J., & Lew, B. (2022). Towards higher psychometric properties: testing the psychological strain scales with larger samples. *Archives of Suicide Research*, 26(2), 912–927. <https://doi.org/10.1080/13811118.2020.1847707>.