



ORIGINAL ARTICLE

Socio-economic inequality and risk of loneliness by personality traits in girl students

ASHRAF DIREKVAND-MOGHADAM, A. HASHEMIAN, AZADEH DIREKVAND-MOGHADAM, Y. VEISANI
Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran

Keywords

Loneliness • Personality traits • Socio-economic factors • Inequality

Summary

Objective. Personality traits can affect humans' mental health. In the present study, we aimed to assess the relation of loneliness to personality traits and also to inequality in socio-economic status in girl students.

Methods. In a cross-sectional study, investigated the relations of personality traits to loneliness in girl students in Ilam from 2014 to 2015. A multistage cluster random sampling method was used to select the participants. The NEO-FFI and University of California, and Los Angeles questionnaires were used for data collection. Data were analyzed by IBM SPSS and Distributive Analysis Stata Package (DASP).

Results. Among 400 recruited participants, 149 (37.2%) were

categorized as having loneliness. The concentration index (CI) for loneliness was 0.19 (95 % confidence interval [CI] 0.07, 0.27), which indicated that loneliness was observed more in persons with high socioeconomic status. The risk of loneliness was 38% lower in persons with higher scores in neuroticism (adjusted odds ratio (AOR) = 0.62, 95% CI: 0.48, 0.91).

Conclusion. We found that socio-economic inequality was observed in relation to loneliness with girls of higher socioeconomic status reporting more loneliness. Therefore, more attention should be directed by policymakers to determining the main contributors to inequality contributors and loneliness in advantaged societies.

Introduction

Public health considers the most fundamental issues in each country in physical, mental and social dimensions [1]. According to the World Health Organization (WHO), mental disorders are serious and frequently occurring disorders throughout the world [2]. In fact, these disorders constitute a large proportion of all patients admitted to medical centers [3]. Personality traits are distinct characteristics that include physical, psychological and behavioral aspects in each person, which distinguishes each individual from others [4]. Most of humans' behaviors are derived from their personalities [5]. Psychologists believe that the personality is shaped and developed constantly from birth to death. In fact, we cannot consider a constant personality in all stages of life [6]. Aging, environment, genetics and family have importance roles in the formation of human personality [7, 8]. Personality traits and mental health are significantly related. Some personality traits put individuals at risk for mental health disorders indirectly by unhealthy behaviors, such as smoking, substance abuse, sleep deprivation, and malnutrition [9, 10].

The NEO Five-Factor Inventory (NEO-FFI) [11] is a most respected and one of the best-known instruments for assessing personality patterns, including: a) neuroticism personality, which is the general tendency to experience negative emotions, such as fear, feeling guilty, anxiety, hatred and nervous; b) extraversion, which refers to the willingness of a person to be energetic, happy and sociable; c) openness, which refers to a person's willingness to be non-traditional,

imaginative and have an interest in art; d) agreeableness, indicating the person's willingness to confide and help others, and generosity; e) and conscientiousness, which is an intention to be reliable, and be diligent and disciplined.

Extraversion and conscientiousness are believed to be the strongest predictors of happiness. In addition, the neuroticism and conscientiousness are the strongest predictors for life satisfaction. Actually, the happiness is associated with high extraversion and low neuroticism [12]. Also, socio-economic-factors can have an effect on mental health in women [13]. Therefore, in this current study we aimed to assess the relation of loneliness to personality traits and determine the relation of socio-economic inequality to loneliness in girl students.

Materials and methods

PARTICIPANTS

Using a cross-sectional study, we investigated the relations of personality traits to loneliness in 400 teenage participants in high schools. The study was conducted in Iran (Ilam Province) during 2014 to 2015. We applied a multistage cluster random sampling method to select participants. The participants were aged 12-18 years old. To select participants in first step, we selected eight high schools by random clustering sampling, and then, five classes in each school were identified. In the final step, participants enrolled in

each class were sampled systematically. Among 409 selected participants 400 (97.7%) responded to the questionnaires. The inclusion criteria were female students with no history of known physical or mental disorders or with recent acute stress (during the prior six months).

The study was approved by the Psychosocial Injuries Research Center, Ilam University of Medical Sciences Ethics Committee, and informed consent was signed by all participants.

SOCIO-ECONOMIC STATUS (SES)

In current study, we have put participants in SES categories (low, middle, and high) by applying principal component analysis (PCA). The 4 items were enrolled to PCA to prediction of SES, including; family income, the educational level of parents (five levels: illiterate, primary school, high school, diploma, university), location of residence (urban/rural), occupation of parents. Therefore according to Friesen study in 2016 we used arbitrary cut-off points are classification of the lowest 40% of households into 'poor', the highest 20% as 'rich' and the rest as the 'middle' group. Eventually, we classified households into quintiles and calculated the mean socio-economic score for each group [14].

ASSESSMENT TOOLS

The NEO-FFI and University of California and Los Angeles (UCLA) questionnaires were used for data collection. Also, the demographic portion of the questionnaire was created using scientific books and similar research and taking into consideration the social and cultural environment. The demographic questionnaire included age, education field and level of parents' location, occupation, family income and educational level.

The NEO-FFI included 60 items which measure the students personality in five dimensions including: neuroticism (items: 1,6,11,16,21,26,31,36,41,46,51,56), extraversion (items: 2,7,12,17,22,27,32,37,42,47,52,57), openness to experience (items: 3,8,13,18,23,28,33,38,43,48,53,58), agreeableness (items: 4, 9,14,19, 24, 29, 34, 39, 44,49, 54, 59) and conscientiousness (items: 5,10,15,20,25,30,35,40, 45,50,55,60). The scores were: totally agree = 4, agree = 3, no comment = 2, disagree = 1 and strongly disagree = 0. The final score was obtained by summing the scores for all questions. The questionnaire scores ranged from 0 to 48 for each dimension. Based on the total score achieved for each dimension, participants were divided into one of three groups (less than 25% represented poor, 25%-75% moderate and more than 75% represented good condition) [15].

The UCLA questionnaire (1978): This questionnaire included 20 items and used a four distinct score scale to measure feelings of social isolation. The scores were: 1 = "I never feel this way", 2 = "I rarely feel this way", 3 = "I sometimes feel this way" and 4 = "I often feel this way". The questionnaire consists of 11 positive and 9 negative items. All negative items including 1-5-6-9-10-15-16-19 and 20, were scored inversely [16]. The lowest total possible score is 20, which represented no loneliness and scores more than 80 represented severe loneliness [17].

STATISTICAL ANALYSIS

Data analyses were conducted using IBM SPSS for Windows ver. 20.0 (IBM Co., Armonk, NY, USA). Descriptive and inferential statistics and the Distributive Analysis Stata Package (DASP) were used to obtain an inequality index (II) for loneliness. The amount of CI is obtained by a Concentration Curve (CC) in which the y-axis is the cumulative percentage of loneliness, and the x-axis is the cumulative percentage of the participants ranked by socioeconomic status. The value of II ranged from -1 to +1; the negative value indicated that the health variable is more concentrated in the poor population, and the positive value indicates more concentration in the rich population [18]. The χ^2 test was used to test categorical variables. Univariate and multivariate logistic regression models were applied to compute Odds Ratios (OR) with 95% Confidence Intervals (95% CI). Confounding factors that were adjusted in multivariate logistic regression models were age, education field and level, parents' educational level and parents' occupation, based on changing the effect by at least 10%. The Hosmer-Lemeshow statistic was evaluated for fit of the models, indicating well fit if the significance value was less than 0.05.

Results

Overall 400 girl students were recruited ranging in age from 14 to 18 years. Participants were in the first to third grade of high school students, with an equal distribution across grades. The mean \pm SD scores in neuroticism, extraversion, and agreeableness traits were significantly higher in non-lonely persons, but no significant differences in loneliness were observed in relation to openness to experience and conscientiousness traits (Tab. I).

Inequality in loneliness by socioeconomic status was calculated using the II. The II for loneliness was 0.19 (95% CI 0.07, 0.27), which indicated a positive inequality in loneliness according to socioeconomic factors; therefore, loneliness was observed more in persons with a high socioeconomic status (Fig. 1).

In this study, multiple logistic regressions were conducted to examine the association between personality traits and loneliness in girl students (Tab. II). In our model, age and other socio-economic factors were covariates and adjusted. The odds of loneliness in girl students was 38% in those with a higher score for the neuroticism trait (adjusted odds ratio (AOR) = 0.62, 95% CI 0.48, 0.91). The odds of loneliness in persons with a higher score for the extraversion trait was lower (AOR) = 0.82, 95% CI 0.63, 0.91). Also, the odds of loneliness was lower for those with higher agreeableness trait (AOR) = 0.90, 95% CI 0.84, 0.96).

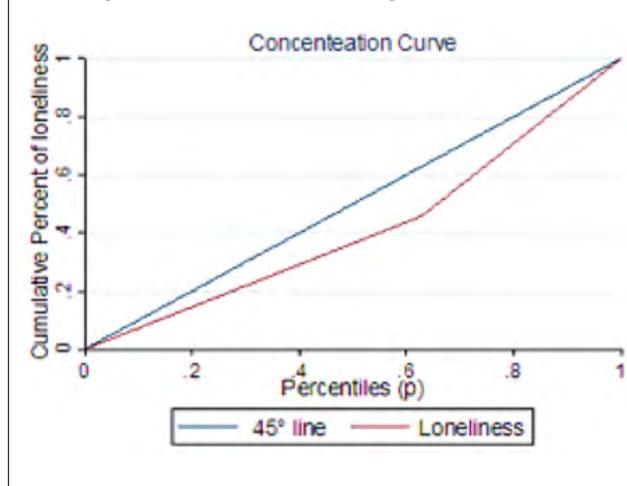
Discussion

In this study, we analyzed of the odds of loneliness by personality traits and socio-economic status in girl students. Some personality traits have shown significant associations with physical and mental human health [19, 20].

Tab. I. The Mean ± SD scores of personality traits and its relationship with loneliness (non-lonely and lonely).

Personality traits	Groups				P-value
	Non-lonely, N = 251		Lonely, N = 149		
	Mean	SD	Mean	SD	
Neuroticism	26.25	6.33	22.03	6.54	<0.001
Extraversion	16.75	5.18	14.68	5.06	0.008
Openness to experience	21.21	4.21	21.23	4.62	0.256
Agreeableness	23	4.65	21.74	3.75	0.011
Conscientiousness	18.32	3.22	17.02	3.9	0.134

Fig. 1. Concentration curve of the inequality index for loneliness according to socioeconomic-factors in girl students.



Our results showed that personality traits, including neuroticism, extraversion, and agreeableness, were significantly associated with loneliness when compared to girls assessed to be non-lonely, but we did not find significant associations of loneliness with the openness to experience and conscientiousness traits. The Mean ± SD of neuroticism trait scores in non-lonely and lonely girls were 26.25 ± 6.33 and 22.03 ± 6.54, respectively. This finding is in line with the results of other studies [20] that have demonstrated a strong correlation between neuroticism and mental health conditions, such as depressive symptoms, anxiety and mental disorder [20]. Also, one study has shown an increased risk of depression in Chinese women with neurotic personality [21].

In this study, inequality in loneliness by socioeconomic factors was calculated using the II. Loneliness was observed more in persons with a high socioeconomic status. The important reasons for inequality in loneliness by socioeconomic -factors can be related to issues of illiteracy and low levels of literacy in Iranian woman. Illiterate persons and families with low levels of literacy have lower income and

less leisure time to spend with their family members. The Behrouzi et al. study (2015) found a significant relationship between family leisure time and family closeness in females [22].

In the present study, we adjusted for confounding factors and based on our results, the odds of loneliness in participants with higher scores for neuroticism, extraversion, and agreeableness trait were lower. Most participants (97%) had moderate flexibility. The basic question is why does openness increase the odds of loneliness among girls so much? We may identify the reason in coping strategies that individuals choose. Most coping strategies reflect individual effort, such as task-oriented coping, emotion-oriented coping and avoidance-oriented coping to improve difficult situations [23].

Some limitations should be mentioned that were present in this study. First, the socioeconomic-factors were limited to educational levels of participants and that of their parents, age, residence, and job of parents. This accounted for 62% of the variance. Second, significant relationships in this cross-sectional study should be interpreted with caution due to the concurrency in of variables assessed in this study so that the temporal relations of variables could not be determined.

In summary, we found that the odds of loneliness differed by personality traits and by socioeconomic status with loneliness observed more in persons with high socioeconomic status.

Acknowledgements

We thank our colleagues from Psychosocial Injuries Research Center of Ilam University of Medical Sciences that sponsored this project financially.

Funding sources: this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Tab. II. The result of multiple logistic regression analysis the association between type of personality and loneliness in girl students.

Personality dimensions	Unadjusted OR (95% CI)	P-value*	Adjusted OR† (95% CI)	P-value‡
Neuroticism	0.67(0.58- 0.88)	0.035	0.62(0.48 - 0.91)	0.002
Extraversion	0.85 (0.68- 0.93)	0.007	0.82(0.63 - 0.91)	0.003
Openness to experience	0.97(0.91- 1.06)	0.353	0.95(0.90 -1.03)	0.270
Agreeableness	0.91(0.83- 0.98)	0.003	0.90(0.84- 0.96)	0.002
Conscientiousness	0.96(0.89-1.10)	0.351	0.93(0.88- 1.07)	0.232

*Calculated by univariate logistic regression analysis; †Adjusting for age, education field and level, parents' educational level and parents' occupation as confounding factors; ‡Calculated by multivariate logistic regression analysis the outcome variable was non-lonely and lonely groups.

Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

AD-M and YV carried out the study, participated in the analysis and manuscript drafting. AD-M participated in analysis and manuscript drafting. AH collaborated in collecting the raw data. YV coordinated the study and participated in the analysis and manuscript drafting. All authors read and approved the final manuscript.

References

- [1] Villanti AC, Collins LK, Niaura RS, Gagosian SY, Abrams DB. Menthol cigarettes and the public health standard: a systematic review. *BMC Public Health* 2017;17:983. <https://doi.org/10.1186/s12889-017-4987-z>
- [2] Kessler R, Aguilar-Gaxiola S, Alonso J, Chatterji S, Lee S, Ormel J, Ustün TB, Wang PS. The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiologia e Psichiatria Sociale* 2009;18:23-33. <https://doi.org/10.1017/S1121189X00001421>
- [3] Steel Z, Marnane C, Iranpour C, Chey T, Jackson J, Patel V, Silove D. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013. *Int J Epidemiol* 2014;43:476-93. <https://doi.org/10.1093/ije/dyu038>
- [4] Fleeson W. Moving personality beyond the person-situation debate: The challenge and the opportunity of within-person variability. *Curr Dir Psychol Sci* 2004;13:83-7. <https://doi.org/10.1111/j.0963-7214.2004.00280.x>
- [5] Honkaniemi L, Feldt T, Metsäpelto R, Tolvanen A. Personality Types and Applicant Reactions in Real-life Selection. *Int J Select Assess* 2013;21:32-45. <https://doi.org/10.1111/ijssa.12015>
- [6] Hudson W, Fraley R. Volitional personality trait change: Can people choose to change their personality traits? *J Pers Soc Psychol* 2015;109:490-50. <https://doi.org/10.1037/pspp0000021>
- [7] Soto C J, John O P, Gosling S D, Potter J. Age differences in personality traits from 10 to 65: big five domains and facets in a large cross-sectional sample. *J Pers Soc Psychol* 2011;100:330-48. <https://doi.org/10.1037/a0021717>
- [8] Jeronimus BF, Ormel J, Aleman A, Penninx BWJH, Riese H. Negative and positive life events are associated with small but lasting change in neuroticism. *Psychol Med* 2013;43:2403-15. <https://doi.org/10.1017/S0033291713000159>
- [9] Charlotte N, Patrick M. Personality, relationships, and health. *J of Pers* 2014;82:467-71. <https://doi.org/10.1111/jopy.12080>
- [10] Franks B, Higgins ET, Champagne FA. A theoretically based model of rat personality with implications for welfare. *PLoS One* 2014;9:e95135-e. <https://doi.org/10.1371/journal.pone.0095135>
- [11] McCrae RR, Costa PT. NEO Inventories: professional manual. Lutz, FL. Psychological assessment resources, Inc. 2010 <https://doi.org/10.4135/9781849200479.n9>
- [12] Kardum I, Krapic N. Personality traits, stressful life events, and coping styles in early adolescence. *Pers Individ Dif* 2001;30:503-15. [https://doi.org/10.1016/S0191-8869\(00\)00041-6](https://doi.org/10.1016/S0191-8869(00)00041-6)
- [13] Veisani Y, Mohamadian F, Delpisheh A. Prevalence and comorbidity of common mental disorders and associations with suicidal ideation in the adult population. *Epidemiol Health* 2017;39:e2017031. <https://doi.org/10.4178/epih.e2017031>
- [14] Friesen CE, Seliske P, Papadopoulos A. Using principal component analysis to identify priority neighbourhoods for health services delivery by ranking socioeconomic status. *Online J Public Health Inform* 2016;8:e192-e. <https://doi.org/10.5210/ojphi.v8i2.6733>
- [15] Spence R, Owens M, Goodyer I. Item response theory and validity of the NEO-FFI in adolescents. *Pers Individ Dif* 2012;53:801-7. <https://doi.org/10.1016/j.paid.2012.06.002>
- [16] Aivazi AA, Menati W, Tavan H, Navkhasi S, Mehrdadi A. Patients' bill of rights and effective factors of workplace violence against female nurses on duty at Ilam teaching hospitals. *J Inj Violence Res* 2017;9. <https://doi.org/10.5249/jivr.v9i1.779>
- [17] Russell D. UCLA Loneliness Scale (Version 3): reliability, validity, and factor structure. *J Pers Ass* 1996;66:20-40. https://doi.org/10.1207/s15327752jpa6601_2
- [18] Valizadeh R, Veisani Y, Delpisheh A, Kikhavani S, Sohrabnejad A. Major depression and psychiatric disorders in Iranian prisoners based on a clinical interview: a systematic review and meta-analysis. *Shiraz E Medical Journal* 2017;18. <https://doi.org/10.5812/semj.44979>
- [19] Kvarstein E, Nordviste O, Dragland L, Wilberg T. Outpatient psychodynamic group psychotherapy - outcomes related to personality disorder, severity, age and gender. *Personal Ment Health* 2016;10. <https://doi.org/10.1002/pmh.1352>
- [20] Jylhä P, Isometsä E. The relationship of neuroticism and extraversion to symptoms of anxiety and depression in the general population. *Depress Anxiety* 2006;23:281-9. <https://doi.org/10.1002/da.20167>
- [21] Taherifard P, Delpisheh A, Shirali R, Afkhamzadeh A, Veisani Y. Socioeconomic, psychiatric and materiality determinants and risk of postpartum depression in border city of Ilam, western Iran. *Depress Res Treat* 2013;2013. <https://doi.org/10.1155/2013/653471>
- [22] Karimi Moonaghi H, Baloochi Beydokhti T. Academic procrastination and its characteristics: a narrative review. *Future of Medical Education Journal*. 2017;7(2):43-50. <https://doi.org/10.22038/FMEJ.2017.9049>
- [23] Penley JA, Tomaka J. Associations among the Big five, emotional responses, and coping with acute stress. *Pers Individ Dif* 2002;32:1215-28. [https://doi.org/10.1016/S0191-8869\(01\)00087-3](https://doi.org/10.1016/S0191-8869(01)00087-3)

Received on April 9, 2019. Accepted on January 10, 2020.

Correspondence: Yousef Veisani, Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran, PO Box: 69311-63545 - E-mail: yousefveisani@yahoo.com - Tel./Fax +98 8432227132

How to cite this article: Direkvand-Moghadam A, Hashemian A, Direkvand-Moghadam A, Veisani Y. Socio-economic inequality and risk of loneliness by personality traits in girl students. *J Prev Med Hyg* 2020;61:E21-E24. <https://doi.org/10.15167/2421-4248/jpmh2020.61.1.1250>

© Copyright by Pacini Editore Srl, Pisa, Italy

This is an open access article distributed in accordance with the CC-BY-NC-ND (Creative Commons Attribution-Non-Commercial-NoDerivatives 4.0 International) license. The article can be used by giving appropriate credit and mentioning the license, but only for non-commercial purposes and only in the original version. For further information: <https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en>