



## ORIGINAL RESEARCH

## Factors Associating Perceived Stress and Psychological Well-being among Iranian Female Adolescents

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### Abstract

**Aim:** 1) To assess the role of life satisfaction, happiness, hopefulness, and self-efficacy, on perceived stress and PWB among a sample of female high school 9<sup>th</sup> graders in Tabriz, Iran; 2) To assess direct and indirect relationships of life satisfaction, happiness, hopefulness, and self-efficacy with PWB in the sample, considering the mediator role of perceived stress under a conceptual model.

**Methods:** This was a cross-sectional study of 289 randomly-selected female 9<sup>th</sup>-grader high school students in Tabriz, Iran, from 2013-2014. Trained study staff obtained consent and asked the participants to complete a self-administered validated questionnaire.

**Results:** Among participants, 64.7% reported mental health problems and 74.3% reported high stress levels. In unadjusted analyses, PWB was positively correlated with life satisfaction, happiness, hopefulness and self-efficacy, and it was negatively correlated with self-perceived stress ( $P < 0.01$  for all correlations). In adjusted analyses, higher life satisfaction and lower stress levels were associated with better PWB ( $P < 0.001$  for all associations). Higher levels of happiness and self-efficacy were associated with lower stress levels.

**Conclusions:** PWB was influenced by a network of interconnected constructs including life satisfaction, happiness, self-efficacy, and stress. Further studies are needed to disentangle the complex relationships within this network.

### Introduction

The concept of health is not confined to the absence of medical illnesses and it encompasses mental and social well-being [1]. Well-being consists of emotional and cognitive components identified as positive affect, absence of negative affect, and a cognitive judgment of satisfaction with life as a whole [2]. Psychological well-being (PWB) and the ways to optimize it have been the focus of many mental health studies over the past decade [2,3]. Among adolescents, PWB and its determinants are not adequately investigated [4-7]. In this population, psychological issues such as anxiety and depression are as common as 70%, and these issues are even more common among female adolescents [8]. In Iran, 78% and 57% of the female and male adolescents, respectively, suffer from depression [8]. Anxiety is also common in as many as 61.7% of teenage female students in Tehran, Iran [8]. Stress is a major risk factor for many mental health disorders including anxiety and depression [9]. Stress affects about one-fifth of those aged 9-17 years and it affects females more than males [10,11].

Factors such as good life satisfaction, happiness, hopefulness, and self-efficacy are reportedly associated with lower levels of stress and lower rate of mental

health problems, and these factors are influenced by various elements such as having supportive social relationships, nurturing family environment, and physical activities [1,3,12-17]. However, some Iranian female adolescents have inadequate access to strong support networks, social relationships, and physical activity, which may predispose them to higher levels of stress and mental health problems. Our aim in this study is twofold: 1) To assess the role of life satisfaction, happiness, hopefulness, and self-efficacy, on perceived stress and PWB among a sample of female high school 9<sup>th</sup> graders in Tabriz, Iran; 2) To assess direct and indirect relationships of life satisfaction, happiness, hopefulness, and self-efficacy with PWB in the sample, considering the mediator role of perceived stress under a conceptual model.

## Methods

### Study design and settings

This was a cross-sectional study of 289 female 9<sup>th</sup>-grader high school students in Tabriz, Iran, in 2013-2014. Trained study staff obtained consent and asked the participants to complete our self-administered validated questionnaire, which required about 90 minutes. Ethical approval was provided by Student Research Committee in Tabriz University of Medical Sciences.

### Participants and sampling

We obtained the list of schools from the Education Department of Tabriz. Among the five educational districts in Tabriz, one district was randomly selected from which two all-female high schools with similar local characteristics were selected for final recruitment. We recruited all 9<sup>th</sup>-graders who consented to participate through quota sampling. Of the 300 students who

were recruited, 289 met the study eligibility and were enrolled in the study. Subsequently, 11 participants were excluded from the sample due to moving out of the area. Therefore, the final sample included 141 students from the 1<sup>st</sup> school and 148 students from the 2<sup>nd</sup> school, with the participation rate of 96%.

### Variables

Study variables included life satisfaction, happiness, hopefulness, self-efficacy, perceived stress, and poor PWB. The assessment tools used to measure the above variables are described in Table 1.

In addition to recording the demographics (age and family size), we used simple yes/no response categories to assess whether the participants had boyfriend(s), enjoyed attending parties, adopted a modern lifestyle [i.e, enjoying modern ideas, beliefs, standards], enjoyed time with their parents, had a healthy diet, exercise regularly, and had adequate time-management skills, perceived having poor mental health, and high stress (Table 2).

### Statistical analysis

We used SPSS 16 and Mplus 6 for our statistical analyses. P values < 0.05 were considered significant. We used chi<sup>2</sup> tests to analyze the associations between categorical variables. To investigate the model fitness, we set the goodness of fit index values for the root mean square error of approximation (RMSEA) at 0.08, and Tucker-Lewis index (TLI) and comparative fit index (CFI) values at 0.90 as criteria for good fitness. The correlation matrix of data was entered into Mplus as input. We dichotomized poor PWB based on a threshold of 23 and coded it zero for scores < 23 (indicating PWB) or one for scores ≥ 23 (indicating poor PWB). Other primary and secondary variables were entered into the

**Table 1:** Study variables and their measurement tools.

Variable	Assessment tool	Cronbach's $\alpha$
<b>Life satisfaction</b>	Translated & validated version of the Satisfaction with Life Scale (SWLS) [21] with 5 seven-point Likert-scale items (1 = strongly disagree to 7 = strongly agree); score range: 5-35; higher scores indicate higher life satisfaction.	0.82
<b>Happiness</b>	Translated & validated version of the Oxford Happiness Questionnaire [22] with twenty 9 six-point Likert-scale items (1 = strongly disagree to 6 = strongly agree); scores range: 29-174; higher scores indicate greater happiness.	0.9
<b>Hopefulness</b>	Translated & validated version of the Snyder's Hopefulness Scale [23] with 12 four-point Likert-scale items (1 = definitely false to 4 = definitely true); score range: 12-48; higher scores indicate higher perceived hopefulness.	0.67
<b>Self-efficacy</b>	Translated & validated version of the Sherer's general self-efficacy scale [24] with 17 five-point Likert-scale items (1 = quite disagree to 5 quite agree); score range: 17-85; higher scores indicate higher perceived self-efficacy.	0.83
<b>Perceived Stress</b>	Translated & validated version of the Cohen's Perceived Stress Scale [25] with 10 four-point Likert-scale items (0 = never to 4 = very often); score range: 0-40; higher scores indicate higher perceived stress.	0.8
<b>Psychological well-being</b>	Translated & validated version of the Goldberg's General Health Questionnaire (GHQ) [26] with 28 four-point Likert-Scale items (0 = No to 3 = Very much) in four main subscales (somatic symptoms; anxiety/insomnia; social dysfunctions, and severe depression); score range: 0-84; higher scores indicate poorer psychological well-being (i.e. lower psychological well-being). A total score of 23 is the threshold for the presence of perceived stress [27].	0.93

model as independent variables. To identify independent predictors of PWB, we also performed adjusted logistic regression between all variables and PWB as the primary outcome, with CI 95% and P values < 0.05 considered as significance.

## Results

As displayed in Table 2, 28% of the participants were 14 years old and 72% were 15-years-old. Of the 289 participants, the majority (64.4%) had a family size of four (two parents and two children), 76% enjoyed spending time with their parents, more than half had boyfriend(s) (51.5%), nearly 80% enjoyed attending parties, and a substantial majority adopted a modern lifestyle (94.8%). Also,

**Table 2:** Characteristics of study participants (n = 289).

Variables	Frequency (%)
<b>Age</b>	
14	81 (28%)
15	208 (72%)
<b>Number of family members</b>	
3	54 (18.6%)
4	186 (64.4%)
> 4	49 (17%)
<b>Have/had boyfriend(s)</b>	
Yes	149 (51.6%)
No	140 (48.4%)
<b>Enjoy attending parties</b>	
Yes	231 (79.9%)
No	58 (20.1%)
<b>Adopt a modern lifestyle</b>	
Yes	274 (94.8%)
No	15 (5.2%)
<b>Enjoy spending time with parents</b>	
Yes	221 (76.5%)
No	68 (23.5%)
<b>Have a healthy diet</b>	
Yes	100 (34.6%)
No	189 (65.4%)
<b>Have regular exercise/work out</b>	
Yes	48 (16.6%)
No	241 (83.4%)
<b>Have good time management skills</b>	
Yes	130 (45%)
No	159 (55%)
<b>Have/had mental health problems</b>	
Yes	187 (64.7%)
No	102 (35.3%)
<b>Have/had high stress levels</b>	
Yes	124 (42.9%)
No	165 (57.1%)

a considerable majority did not exercise regularly (83.4%), and 55% reported lack of adequate time-management skills (55%). The percentage of students who perceived having mental health issues and being under high stress were 64.7% and (42.9%), respectively. Table 3 shows the zero-order correlations for the main predictor variables in the study. Higher levels of happiness and self-efficacy were associated with lower stress levels.

As displayed in Table 4, in adjusted analyses, PWB was positively associated with life satisfaction, happiness, hopefulness and self-efficacy, and it was negatively associated with self-perceived stress ( $P < 0.01$  for all associations).

Figure 1 shows the full model constructed based on the structural equation model ( $\chi^2 = 43.80$ ,  $n = 289$ ,  $df = 34$ ,  $p < 0.01$ , CFI = 0.97, TLI = 0.93, RMSEA = 0.03, CI: 0.010 to 0.068,  $\chi^2/df = 1.28$ ). In our study, higher levels of happiness and self-efficacy were associated with lower stress levels, whereas having boyfriend(s) was associated with higher stress. We did not observe any significant life satisfaction-stress or hopefulness-stress association. Moreover, higher life satisfaction and lower stress levels were associated with better PWB. The other primary or secondary variables did not have any significant association with PWB.

## Discussion

Our findings showed that higher levels of life satisfaction were associated with better PWB. Also, higher levels of happiness and self-efficacy were associated with lower levels of stress, and lower stress levels were subsequently associated with better PWB. In contrast, having boyfriend(s) was associated with higher levels of stress. The other associations were not significant.

Life satisfaction is considered a key construct in establishing well-being among youth as it represents the cognitive appraisal of their overall quality of life based on self-selected standards [3]. In a study of 490 mostly Caucasian students in 6<sup>th</sup>-12<sup>th</sup> grades in the Southeast US, high global life satisfaction was associated with more positive relationships with parents and peers, more positive perceptions of teachers, higher levels of hope, a greater sense of personal control, less social stress and intrapersonal distress, and less anxiety and depression. In addition, 42%, 7%, and none of those with low, average, and high levels of life satisfaction, respectively, had clinical symptoms of psychological disorders [3]. Life satisfaction is reportedly influenced by physical activity. In

**Table 3:** Inter-correlations of study variables.

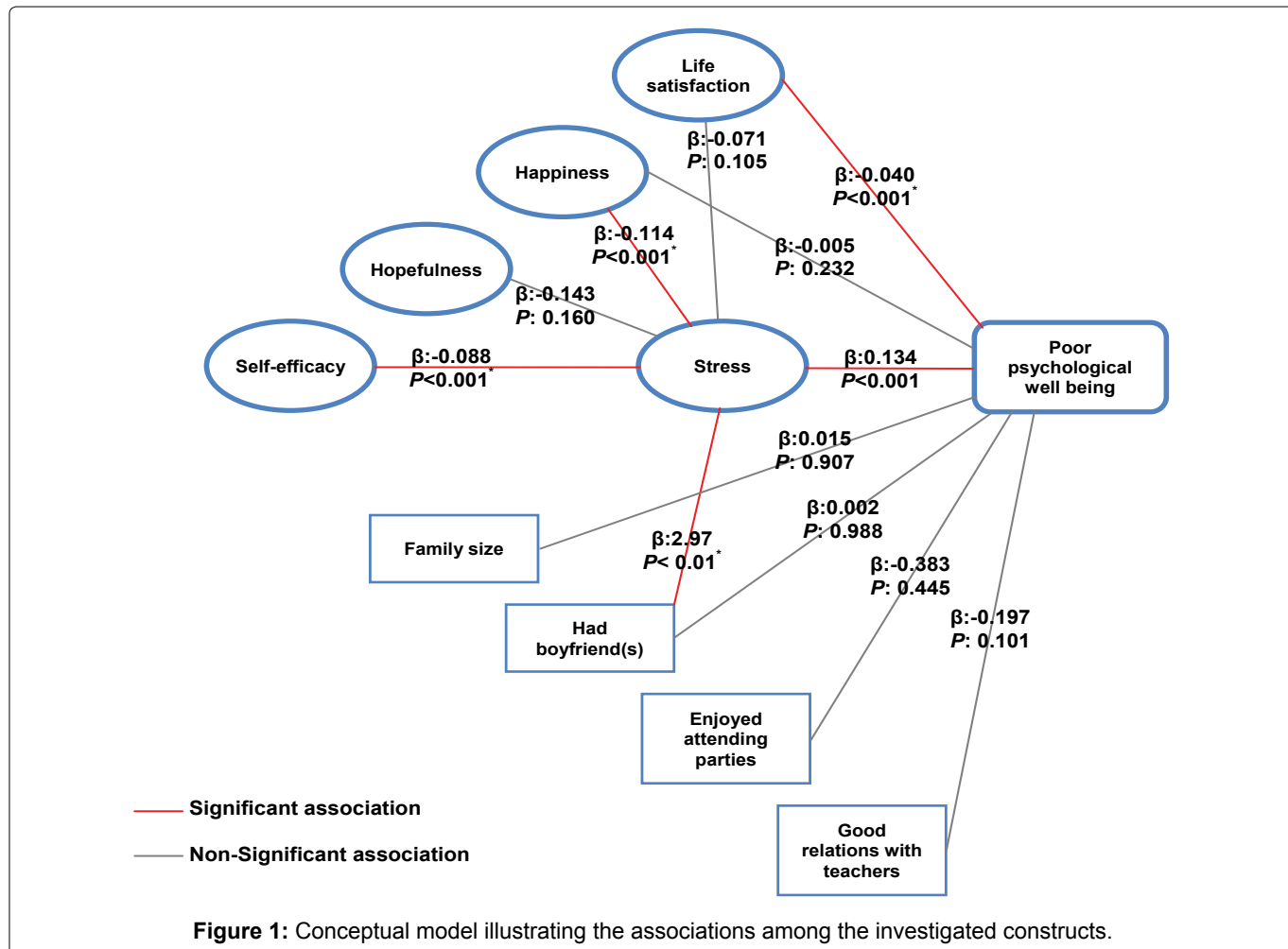
Variables	Mean (SD)	X1	X2	X3	X4	X5
X1. Life Satisfaction	20.06 (6.36)					
X2. Happiness	112.40 (19.11)	0.597**				
X3. Hopefulness	33.21 (3.72)	0.328**	0.445**			
X4. Self-efficacy	57.97 (9.98)	0.423**	0.470**	0.652**		
X5. Stress	23.65 (5.75)	-0.428**	-0.565**	-0.428**	-0.431**	

\*\*p < 0.01.

**Table 4:** Unadjusted and Adjusted odds ratio (AOR) and 95% confidence interval (CI) of the psychological well-being in relation to sample characteristics among female 9<sup>th</sup>-grader high school students in Tabriz, Iran.

Variables	Un-adjusted				Adjusted			
	OR	Lower	Upper	P-Value	OR	Lower	Upper	P-Value
<b>Step1</b>								
Self-efficacy	0.91	0.88	0.94	< 0.001	1.00	0.95	1.05	0.959
hopefulness	0.65	0.59	0.82	< 0.001	0.91	0.79	1.05	0.212
Life satisfaction	0.84	0.80	0.88	< 0.001	0.91	0.85	0.97	< 0.001
Perceived stress	1.45	1.32	1.59	< 0.001	1.39	1.25	1.53	< 0.001
Happiness	0.93	0.91	0.95	< 0.001	0.99	0.96	1.01	0.49
<b>Step2</b>								
<b>Birth order</b>								
1	0.65	0.16	2.58	0.549	-----	-----	-----	-----
2	0.67	0.16	2.70	0.574	-----	-----	-----	-----
3	0.77	0.17	3.43	0.741	-----	-----	-----	-----
4 ≥	Referent	-----	-----	-----	-----	-----	-----	-----
<b>Good relations with teachers</b>								
Yes	0.45	0.33	0.63	< 0.001	-----	-----	-----	-----
No	Referent	-----	-----	-----	-----	-----	-----	-----
<b>Had boyfriend(s)</b>								
Yes	0.35	0.21	0.58	< 0.001	-----	-----	-----	-----
No	Referent	-----	-----	-----	-----	-----	-----	-----
<b>Having the history of smoking</b>								
Yes	0.67	0.17	2.61	0.573	-----	-----	-----	-----
No	Referent	-----	-----	-----	-----	-----	-----	-----
<b>Willingness to participate in a friendly party</b>								
Yes	0.38	0.21	0.69	< 0.001	-----	-----	-----	-----
No	Referent	-----	-----	-----	-----	-----	-----	-----

OR: Odds ratio, Lower: Lower Bound for 95% C.I. for OR, Upper: Upper Bound for 95% C.I. for OR, Hosmer and Lemeshow Test showed a acceptable of model fit (Chi-square (10) = 6.13, P = 6.32), A total of 83% of subjects were correctly classified.



**Figure 1:** Conceptual model illustrating the associations among the investigated constructs.

a study of 4,758 adolescents in South Carolina, various measures of inadequate physical activity were associated with lower life satisfaction levels [12]. In our study, the majority of participant adolescents did not report any routine exercise, which might predispose them to reduced life satisfaction and well-being.

Happiness is another crucial construct influencing well-being among youth, and it encompasses mental processes regarding how life is interpreted and received by them [14]. Multiple reports have linked happiness to lower stress in adolescents from school to college [1,13,14]. In a study of 887 Norwegian school adolescents, those who felt very happy had the lowest stress levels, the highest general and school self-efficacy levels, and the highest support from their teachers and peers [1].

Another key construct is hopefulness, and it involves the belief that the person can move towards his or her goals [18]. In a study of 699 middle and high school students in the Southeast US, higher hope levels were associated with higher life satisfaction levels and lower levels of stressful life events. The study also found a negative effect of stressful life events on life satisfaction, and this effect was strongest amongst the students with low hope levels [15].

Self-efficacy, another key factor in well-being, involves the individuals' competence to tackle challenging tasks and cope with adversity in demanding situations, and it influences how people feel, think, and act [16]. Optimism, self-esteem, and self-regulation were positively associated with self-efficacy in a multivariate regression analysis of data from 8,796 participants - mainly school students - from the US, Costa Rica, Germany, Poland, and Turkey ( $p < 0.01$  for all associations;  $\beta$ : 0.5-0.7). In addition, those with higher self-efficacy levels were found to overcome obstacles more easily, focus on opportunities more frequently, and have the ability to perceive stressful situations as challenges rather than unbearable difficulties [16]. Individuals with higher levels of self-efficacy usually have good problem solving abilities, whereas those with lower self-efficacy levels are deemed to feel helpless, anxious, and depressed [16].

Various types of stress, ranging from daily stressors to major life events, are reported to impact psychological and physical well-being [14]. In a study of 1,038 Canadian high-school 9<sup>th</sup>-12<sup>th</sup> graders, higher levels of stress imposed by the family, school and peers were associated with higher levels of anxiety, depression, anergia, and social dysfunction, thus lower PWB ( $P < 0.05$  for all associations except for peer stress-anxiety, peer stress-anergia, and social stress-social dysfunction) [17]. Adolescents are commonly exposed to various stressors including their professional plans, grades, dating, and sexual and social identity challenges. In our study, ha-

ving boyfriend(s) was associated with higher stress levels. Adolescent girls with significant changes in their lives, e.g. starting to date, experience lower levels of self-esteem [19], which may predispose them further to stress. In addition, some Iranian families have cultural and religious beliefs discouraging or restricting premarital relationships. When exposed to stress, adolescents need support from family and friends. Without support, they may feel vulnerable, hopeless, and psychologically ill [20]. We found lower stress to be a cornerstone towards better PWB as higher levels of happiness and self-efficacy was associated with lower stress, and lower stress associated with higher PWB. Thus, our results were in line with the previous studies.

## Limitations

Our study has the inherent limitations of cross-sectional studies. As all variables were measured at the same time, our implied directions of associations are not necessarily exact. Also, our limited resources did not allow us to recruit subjects from more than two - randomly selected - high schools, and to acquire a comprehensive mental health history from each participant. Nevertheless, our data collection was carried out by trained staff using validated assessment tools organized into a user-friendly questionnaire.

## Conclusions

Among the studied Iranian female adolescents, PWB was influenced by a network of interconnected constructs including life satisfaction, happiness, self-efficacy, and stress. The research on PWB has evolved in the past decade; nevertheless, further studies are needed to disentangle the complex relationships within the network of the constructs influencing PWB. We suggest future studies to develop and study the interventions designed to improve PWB and the factors influencing it the most.

## Authors' Contributions

All authors read and approved the final manuscript. H.H and H.A. conceived the study and participated in the design, data collection and data analysis as well as preparing and finalizing the manuscript. A.S. participated in data analysis and manuscript preparation. S.B. and A.S. assisted in drafting and finalizing the manuscript.

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## Competing Interests

The authors declare that they have no competing interests.

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