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Psychometric Properties of the Procrastination Assessment Scale-Student (PASS) in a Student Sample of Sabzevar University of Medical Sciences

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Background: Procrastination is a common behavior which affects different aspects of life. The procrastination assessment scale-student (PASS) evaluates academic procrastination apropos its frequency and reasons.

Objectives: The aims of the present study were to translate, culturally adapt, and validate the Farsi version of the PASS in a sample of Iranian medical students.

Patients and Methods: In this cross-sectional study, the PASS was translated into Farsi through the forward-backward method, and its content validity was thereafter assessed by a panel of 10 experts. The Farsi version of the PASS was subsequently distributed among 423 medical students. The internal reliability of the PASS was assessed using Cronbach's alpha. An exploratory factor analysis (EFA) was conducted on 18 items and then 28 items of the scale to find new models. The construct validity of the scale was assessed using both EFA and confirmatory factor analysis. The predictive validity of the scale was evaluated by calculating the correlation between the academic procrastination scores and the students' average scores in the previous semester.

Results: The corresponding reliability of the first and second parts of the scale was 0.781 and 0.861. An EFA on 18 items of the scale found 4 factors which jointly explained 53.2% of variances: The model was marginally acceptable (root mean square error of approximation [RMSEA] =0.098, standardized root mean square residual [SRMR] =0.076, χ^2/df=4.8, comparative fit index [CFI] =0.83). An EFA on 28 items of the scale found 4 factors which altogether explained 42.62% of variances: The model was acceptable (RMSEA =0.07, SRMR =0.07, χ^2/df=2.8, incremental fit index =0.90, CFI =0.90). There was a negative correlation between the procrastination scores and the students' average scores (r = -0.131, P =0.02).

Conclusions: The **F**arsi version of the PASS is a valid and reliable tool to measure academic procrastination in Iranian undergraduate medical students.

Keywords: Validation Studies; Students; Education; Medical; Undergraduate

1. Background

Procrastination means a purposive, habitual, intentional, and needless delay in beginning or completing tasks, which prevents individuals from reaching their goals (1). Most people procrastinate sometimes, but some people chronically tend to postpone their tasks, which may cause severe problems. Studies have shown that procrastination is prevalent in both general (2) and academic (3) populations and that it can implicate various aspects of life such as work, career, marriage, social relations, and financial management. The prevalence of procrastination has been reported to be 20% (4), 15% - 25% (5), and 46% (2) in different studies.

Academic procrastination, defined as postponing academic assignments and tasks (6), is a prevalent issue (7). In a study, Ferrari reported that 70% - 95% of the students procrastinated on their assignments '(4). Short-term academic procrastination may be accompanied by pleasure, but in the long term, it may lead to such negative outcomes as anxiety, stress, and depression (8). Researchers have proposed different factors pertaining to academic procrastination. Ozer in Turkey suggested 4 factors: perfectionism, task aversion, rebellion against control, and risk taking (9). Likewise, Onwuegbuzie reported that a fear of failure and task aversion were responsible for procrastination in writing term papers in the graduate students recruited in the study (10). The results of some other studies have indicated that procrastination goes in tandem with a lack of self-determined motivation, intrinsic reasons for pursuing academic tasks (11), and low academic self-efficacy and self-esteem (12). Procrastination is also correlated positively and significantly with test anxiety (13). In consequence, academic procrastination is likely to interfere with academic achievement (14, 15). The significance of

the different medical fields dictates that medical students study deeply and gradually; it is, thus, advisable that procrastinating medical students and the reasons behind their procrastination be pinpointed so that information can be provided to them as regards the consequences of their procrastination. In addition, university instructors should be able to identify procrastinators. These are the reasons why the development of an instrument to identify the problem and its underlying causes is of such importance. Regrettably, there are only a few instruments available for measuring procrastination such as the Tuckman procrastination scale (12) and the procrastination assessment scale-students (PASS). The PASS was originally developed by Solomon and Rothblum (3). This useful instrument has since been translated and used in Iran (16); however, there has yet to be a paper with regard to its validity. The lack of a comprehensive and validated instrument for the assessment of academic procrastination in Iran constitutes a barrier to delving into the problem and its reasons as well as devising appropriate interventions.

2. Objectives

The aims of this study were to translate and validate the PASS into Farsi in order to assess procrastination in Iranian students.

3. Patients and Methods

This cross-sectional study was conducted on 423 students of Sabzevar university of medical sciences, which is a public university. The inclusion criterion required the participants to be undergraduate students. Students who did not fill out the questionnaire completely were excluded from the study. The stratified random sampling method was employed to collect the data. The total number of the medical undergraduate students of Sabzevar university of medical sciences was 1,166. Therefore, almost one-third of the students were included in the study. One-third of the students of each 4 levels in different courses were randomly selected. The sample size was determined based on the exploratory factor analysis (EFA), which considered 10 subjects per item satisfactory. Since the scale contained 46 items divided into 2 parts (first part = 8 items and second part = 28 items), a sample of 280 students was enough. In previous studies, the rate of procrastination was estimated at 50%–90%. Using the formula pqz^2/d^2, with a confidence level of 95% and a degree of precision of 0.05, the required sample size was estimated at 138 - 384.

(1) $$\frac{pqz^2}{d^2}$$

Considering a higher estimation and probability of incomplete questionnaires of 10%, the sample size was determined at 423.

3.1. Instruments

3.1.1. World Health Organization-5 Well-Being Index (WHO-5)

The world health organization-5 questionnaire (WHO-5 questionnaire) (17) consists of 5 positively worded items on the respondent's feelings during the preceding 2-week period. Each item is rated on a 6-point Likert scale from 0 to 5, with 0 indicative of positive feelings at no time and 5 indicative of constant positive feelings. The total score ranges from 0 to 25. The WHO-5 has been validated in previous studies (18, 19) and translated into Farsi and validated (20).

3.1.2. Procrastination Assessment Scale-Student (PASS)

The PASS was created by Solomon and Rothblum (3) and includes 44 items in 2 parts. The first part consists of 18 items measuring the level of procrastination in 6 academic domains: 1) writing a term paper, 2) studying for an exam, 3) keeping up with weekly reading assignments, 4) performing administrative tasks, 5) attending meetings, and 6) performing academic tasks in general. Each of these 6 domains contains 3 items rated on a 5-point Likert-type scale. The first item measures the frequency of procrastination on academic tasks, the second item measures the extent to which procrastination on the task was causing a problem for students, and the third item measures the extent of students' willingness to decrease their procrastination.

The second part of the PASS contains 26 items, each rated on a 5-point Likert-type scale ranging from 1 indicative of "not at all reflects why I procrastinated" to 5 indicative of "definitely reflects why I procrastinated". This part assesses the reasons for academic procrastination (ranging from 26 to 130). The validity of the PASS was confirmed during the early development of the scale (3) and its reliability in subsequent studies (21, 22).

3.2. Content Validity

A forward-backward translation method was employed while preserving the semantics of the phrases'. A PhD holder in the English language translated the PASS into Farsi, and another PhD holder in the English language translated it into English. Finally, a bilingual PhD instructor compared the Farsi version, the back-translated English version, and the original version. Some minor corrections were made. Content validity was assessed both qualitatively and quantitatively by an expert panel, comprised of 3 experts in educational psychology and 7 PhD-holding faculty members with at least a 10-year educational background, who discussed each item and the relevancy of the items to Iranian culture. The content validity ratio (CVR) of each item of the PASS was calculated. The CVR of all the domains and items except the sixth domain (ie, university activities in general) exceeded 0.62

(23). The panelists argued that this domain was repeated in the previous domains. Nevertheless, we did not exclude the sixth domain and instead changed the domain title to "other university activities such as cultural, athletic, and artistic activities" according to the panelists' recommendations. The panelists were asked to express their opinion on the clarity, simplicity, and relevancy of each item to Iranian culture. The content validity index (CVI) was calculated for each item. The minimum acceptable CVI is 0.8 (24). The CVI of all the items exceeded 0.8. The experts recommended an idiomatic substitute for Item 34. 'We, also, changed Item 43 from "You felt you were too lazy to do the project." to "You felt that the project was too hard for you to do." since the experts maintained that it is not usual in our culture for individuals to acknowledge their own weaknesses and insufficiencies.

3.3. Face Validity

Face validity was determined through the selection of 30 students from 3 different grades. The students were asked to fill out the instrument to identify the time needed for completing the instrument and explain their interpretation of the items. Thereafter, 3 group discussions were held where the students discussed vague items and the scaling and wording of the items. Two more items were added to the reasons for procrastination in keeping with the students' ideas: "You anticipated the cancelation of the project." and "You thought that at the end of the semester, your professor would be too busy to check your work meticulously." Furthermore, Item 20 was changed from "You waited for your classmate to help." to "You waited for your classmate's presentation to learn how to prepare your work."

3.4. Statistical Software

The data were analyzed using Statistical Package for the Social Sciences (SPSS), version 18.0 (SPSS Inc., Chicago, IL, USA) for Windows. Additionally, LISREL, version 8.80 (Scientific Software International, Inc. 2007) was utilized for the confirmatory factor analysis (CFA).

3.5. Data Analysis

The individuals' mean imputation was drawn upon in order to deal with missing data (25). Normality checking revealed that the 46 items were normally distributed. There was neither a ceiling nor a floor effect. The internal consistency of the instrument was assessed using Cronbach's alpha coefficient. A Cronbach's alpha value > 0.6 was regarded as acceptable (26). The construct validity was assessed using an EFA and a CFA. The CFA was conducted via structural equation modeling. The χ^2/df < 5.00, comparative fit index (CFI) value < 0.90, root mean square error of approximation (RMSEA) value < 0.08 (27, 28), and standardized root mean square residual (SRMR) value < 0.08 (29) were considered as acceptable model fit. An RMSEA value > 1 was considered as rejectable model fit. The EFA was conducted utilizing the principal component analysis with Promax rotation. The criterion for retaining the items was having item-loading ≥ 0.3. The criterion for selecting the factors was the screen test (30). The EFA was carried out with values one higher and one lower than the ones proposed by the scree plot, and the values were subsequently compared. A factor structure, including the highest factor loads with the lowest cross-loadings (an item factor load > 0.32 in 2 or more factors) and having at least 3 items in each factor, was determined as the final factor structure. The factors were named based on their items with the highest factor loading (6). Convergent validity was assessed by examining the relationship between the items and the proposed factor. Discriminant validity was assessed by examining the possibility of cross-loadings and inter-correlations between the factors ≥ 0.7. The predictive validity of the scale was evaluated by the correlation between the procrastination scores and the students' average scores in the previous semester. The t-test was used to compare the procrastination scores between the male and female students as well as between those who were single and the ones who were married.

3.6. Ethics

Ethical issues in connection with the current study were completely observed in that not only was permission to use the procrastination scale obtained from the author but also the participants were informed that their participation was voluntary, all their information would be kept confidential, and they could refuse to fill out the questionnaire even after receiving the questionnaire. The study protocol was approved by the Ethics Committee of Sabzevar University of Medical Sciences (approval # 93.49).

4. Results

This cross-sectional study was conducted on 423 students of Sabzevar university of medical sciences. Twenty-three questionnaires were excluded due to incompleteness. The mean age of the students was 20.6 ± 2.1 years. The characteristics of the participants are depicted in Table 1. The score of the first 2 items of all the 6 domains of the first part of the instrument were added up in order to create the procrastination score. The mean procrastination score was 35.75 ± 6.65 (ranging from 13 to 57). The results revealed that 34.8%, 37.1%, 49.9%, 13.8%, 27.6%, and 44.4% of the participants procrastinated most of the time or always in the first to sixth domains of the scale, correspondingly.

4.1. Reliability

Reliability was assessed using Cronbach's alpha coefficient. The reliability of the WHO-5 scales was 0.887. The reliability of the first and second parts of the PASS was 0.781 and 0.861, respectively (Table 2).

Table 1. Study Sample Characteristics and the Means of the Procrastination Score [a,b]

Variables	Values	Values	P Value
Age, y			0.27
≤ 20	222 (56.6)	35.4 ± 6.7	
> 20	178 (43.4)	36.2 ± 6.6	
Gender			0.69
Female	304 (76.2)	35.8 ± 6.5	
Male	96 (23.8)	35.5 ± 7.2	
Marital status			0.04 [c]
Single	319 (79.9)	35.4 ± 6.5	
Married	81 (20.1)	37.2 ± 7.3	
Grade level			0.43
Freshman	165 (40)	35.3 ± 6.9	
Sophomore	142 (35.5)	36.2 ± 6.7	
Junior	88 (22)	35.8 ± 6.3	
Senior	10 (2.5)	35.2 ± 5.2	
Resident in dormitory			0.98
Yes	266 (66.7)	35.7 ± 6.4	
No	134 (33.3)	35.8 ± 7.2	

[a] (N = 400).
[b] Data are presented as No. (%) or mean ± standard deviation (SD).
[c] < 0.05

4.2. Concurrent Validity

The concurrent validity of the scale was assessed through the correlation of the procrastination scale and the WHO-5 well-being index. There were weak and negative correlations between the academic procrastination scores and the WHO-5 (r = -0.195, P <0.001).

4.3. Predictive Validity

Based on the assumption that the procrastinators would achieve lower academic scores, we assessed the predictive validity of the academic procrastination scale by calculating the correlation between the academic procrastination scores and the students' average scores in the previous semester. There was a weak and negative correlation between the procrastination scores and the students' average scores (r = -0.131, P = 0.02).

4.4. Known Group Comparison

Based on the assumption that the students who were married would procrastinate more than those who were single because they were busy, we compared the procrastination score of the 2 groups. There was a significant difference between the 2 groups, with the married students having' higher procrastination scores (P = 0.04).

4.5. Results of Factorial Analyses

Construct validity was assessed using the CFA and EFA. First, a CFA was conducted on the first part of the scale (18 items). The weak fit indices indicated that the proposed model did not fit our data (RMSEA = 0.11, CFI = 0.8, χ^2/df = 6). The sample was split into 2 equal halves and an EFA was carried out on 18 items of the scale on 200 cases to find a new model. According to the scree plot, 4 factors were considered. The Kaiser-Meyer-Olkin measure of sample adequacy was 0.728, and the Bartlett test of sphericity was significant (χ^2 = 2130, P < 0.001). There were 4 factors with eigenvalue > 1, which jointly explained 53.2% of variances: 1) willingness to decrease procrastination, 2) frequency of procrastination, 3) causing a problem in the second 3 domains of procrastination, and 4) causing a problem in the first 3 domains of procrastination. The items within each factor were highly correlated, which was evidence of convergent validity. Although there were 4 items which loaded on 2 factors (loading on the second factor > 0.32), there were gaps > 0.2 between primary and cross loading. The correlations between the factors did not exceed 0.7, denoting discriminant validity (Table 3). Subsequently, a CFA was performed on the other half of the sample to confirm the new model (Figure 1). The results showed that the new model was marginally acceptable (RMSEA = 0.098, SRMR = 0.076, χ^2/df = 4.8, CFI = 0.83, Hoetler's N index = 76).

Table 2. Descriptive Statistics and Reliability of the Procrastination Scale Factors

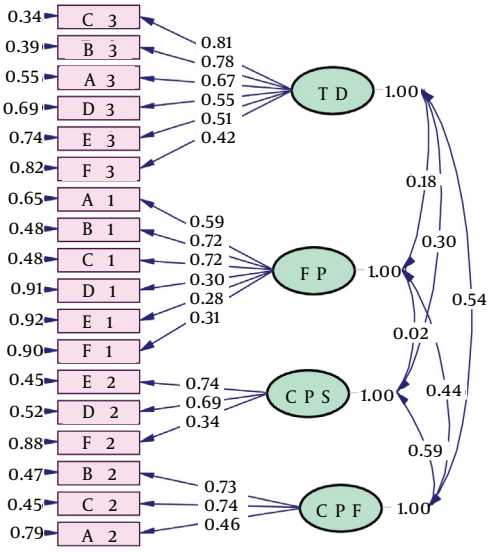
Scale's Parts	Scale's Factors			
Scale's first part	**First Part Factors**			
Factors [a]	1	2	3	4
Mean ± SD	3.5 ± 1	2.9 ± 0.71	2.7 ± 0.88	3.4 ± 0.80
Cronbach's alpha coefficient	0.80	0.87	0.67	0.60
Total	0.781			
Scale's second part	**Second Part Factors**			
Factors	Low confidence	Risk taking	Laziness	Dependency
Mean ± SD	2.35 ± 0.85	1.97 ± 0.83	2.67 ± 0.86	2.64 ± 0.77
Cronbach's alpha coefficient	0.728	0.773	0.726	0.741
Total	0.861			

[a] Names of the factors in the first part of the scale: 1) 'Willingness to decrease procrastination', 2) 'Frequency of procrastination', 3) 'Causing a problem in the second 3 domains', 4) 'Causing a problem in the first 3 domains'.

Table 3. Factor Correlation Matrix Results for Discriminant Validity

Scale Components	Factors			
First part's components	**1**	**2**	**3**	**4**
1. Willingness to decrease procrastination	1.000			
2. Frequency of procrastination	0.143	1.000		
3. Causing a problem in D, E, and F domains	0.126	0.217	1.000	
4. Causing a problem in A, B, and C domains	0.139	0.122	0.370	1.000
Second part's components	1	2	3	4
1. Low confidence	1.000			
2. Risk taking	0.281	1.000		
3. Laziness	0.378	0.254	1.000	
4. Dependency	0.423	0.211	0.266	1.000

Figure 1. Confirmatory Factor Analysis (CFA) on 18 Items



chi square = 620.31 , df=129 , p - value = 0.00000 , RMSEA = 0.098

TD = willingness to decrease procrastination, FP = frequency of procrastination, CPS = causing problems in the second 3 domains, CPF = causing problems in the first 3 domains, A. writing a term paper; B. studying for an exam; C. doing reading assignments; D. performing administrative tasks; E. attending meetings; F. performing other academic tasks.

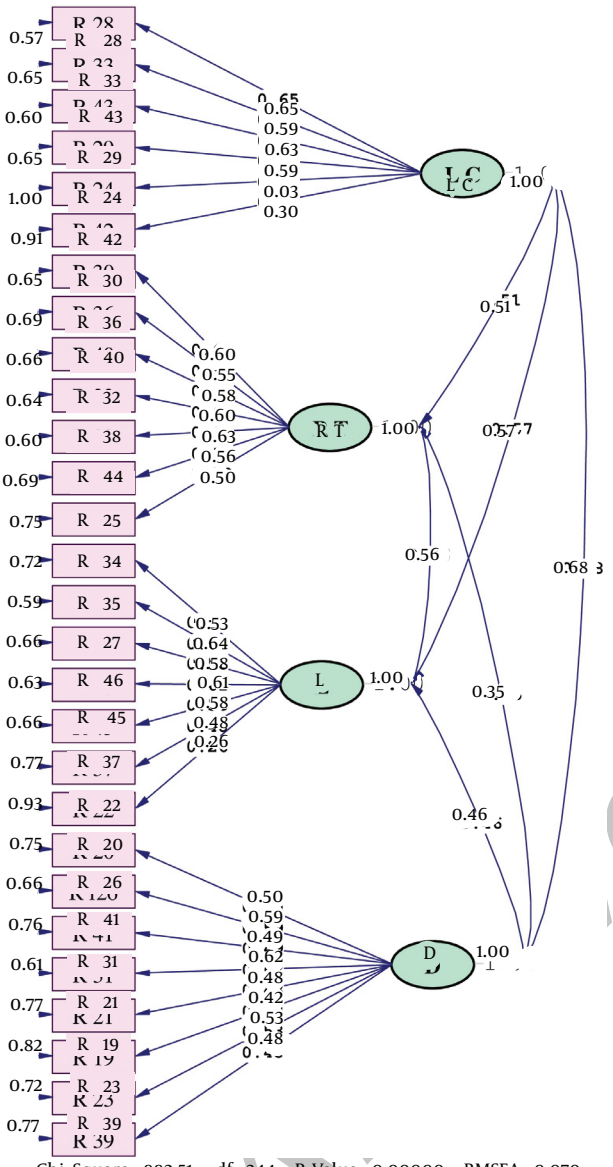
The second part of the scale (28 items) deals with the reasons for procrastination. Since the author (3) managed to find only 2 factors via the EFA, namely fear of failure and task aversion, which covered only 8 items, we split the sample into 2 equal halves and conducted an EFA on the 28 items of the scale on 200 cases to identify a new factorial model. The scree plot found 4 factors. Since there was inconsistency between the number of the factors that the author found and the number of the factors that we found, we instructed the software to extract 1, 2, 3, 4, and 5 factors separately. The results of the EFA on the 28 items revealed that choosing the 4 factors yielded better results in terms of having the highest number of items with factor loads > 0.5 and the lowest number of items with cross-loading. The Kaiser-Meyer-Olkin measure of sample adequacy was 0.855, and the Bartlett' test of sphericity was significant ($\chi^2 = 2938$, $P < 0.001$). The 4 factors altogether explained 42.62% of variances (Table 4). The correlations between the factors did not exceed 0.7, which was evidence of discriminant validity (Table 3). There were 5 items with cross-loading (Items 38, 25, 27, 23, and 39). Subsequently, a CFA was performed on the other half of the sample to confirm the new model (Figure 2). The results showed that the new model was acceptable (RMSEA = 0.07, SRMR =0.07, χ^2/df = 2.8, incremental fit index [IFI] =0.90, CFI =0.90, Hoetler's N index = 115).

Table 4. Results of the Exploratory Factor Analysis on the 28 Items of the Second Part of the Scale

Scale Second Part's Items	Component[a] and Factor Loadings			
Reasons for procrastination	**1**	**2**	**3**	**4**
28. You felt overwhelmed by the task.	0.685			
33. You did not' trust yourself to do a good job.	0.674			
43. You felt that the project was too hard for you to do.	0.651			
29. You had difficulty requesting information from other people.	0.587			
24. You were worried that you would get a bad grade.	0.546			
42. You set very high standards for yourself and you worried that you wouldn't be able to meet those standards.	0.383			
30. You looked forward to the excitement of doing this task at the last minute.		0.714		
36. You liked the challenge of waiting until the deadline.		0.710		
40. You were concerned that if you got a good grade, people would have higher expectations of you in the future.		0.661		
32. You were concerned that if you did well, your classmates would resent you.		0.611		
38. You resented people setting deadlines for you.		0.499	0.395 [b]	
44. Your friends were pressuring you to do other things.		0.486		
25. You resented having to do things assigned by others.		0.353		
34. You didn't have enough energy to begin the task.			0.735	
35. You felt it would take too long to write a term paper.			0.656	
27. You really disliked writing term papers.	0.449 [b]		0.590	
46. You thought that at the end of the semester, your professor would be too busy to check your work meticulously. [c]			0.584	
45. You anticipated the cancelation of the project. [c]			0.557	
37. You knew that your classmates hadn't started the paper either.			0.507	
22. You had too many other things to do.			0.331	
20. You waited for your classmate's presentation to learn how to prepare your work.'				0.689
26. You didn't think you knew enough to write the paper.'				0.595
41. You waited to see if the professor would give you some more information about the paper.				0.578
31. You couldn't choose from among all the topics.				0.557
21. You had a hard time deciding what to include and what not to include in your paper.				0.551
19. You were concerned that the professor wouldn't like your work.				0.523
23. There was some information you needed to ask the professor, but you felt uncomfortable approaching him/her.	0.365 [b]			0.446
39. You were concerned that you wouldn't meet your own expectations.	0.371 [b]			0.404
Eigenvalue	3.12	3.05	3.01	2.76
Variances, %	11.15	10.88	10.76	9.84

[a] 1. Low confidence. 2. Risk taking. 3. Laziness. 4. Dependency.
[b] Cross-loading.
[c] New items.

Figure 2. CFA on 28 Items



L C = low confidence, R T = risk taking, L = laziness, D = dependency.

5. Discussion

In the present study, we translated the PASS into Farsi and assessed its reliability and validity in a sample of Iranian medical students. The results indicated that the Farsi version of the PASS was a reliable and valid instrument for assessing academic procrastination. The content validity process did not lead to any item exclusion, but 2 items were added and some items were replaced with proper idiomatic substitutes in order that they would be congruent with our culture.

The reliability of the first (0.78) and second part (0.86) of the scale was acceptable. Onwuegbuzie found reliability of 0.82 for the first and 0.89 for the second part of the scale (31).

Concurrent validity was assessed through the correlation between the scores of procrastination and the WHO-5. As the WHO-5 differed from the procrastination scale in nature, the weak and negative correlation coefficient observed may be satisfactory. In Solomon's study, task aversion was allied with depression and low confidence. She also found a weak correlation (r =0.13) between the Spielberger trait anxiety scale and the PASS '(3).

The predictive validity of the procrastination scale was confirmed by the negative correlation (r = -0.131) between the scores of procrastination and the students' average score. We found no significant difference in academic procrastination vis-à-vis gender, which chimes in with previous studies in Turkey and India (15, 32).

The results of the CFA showed that the first and second factors of the first part of the scale were similar to the factors found in some previous studies (3, 22). In the second part of the scale, the CFA confirmed 4 factors. In the original PASS, the results of the factor analysis yielded 2 main factors: fear of failure and task aversion (3). Ozer also found 4 factors: fear of failure, risk taking, laziness, and rebellion against control (22).

In our study, the frequency of procrastination was highest in the regular reading assignment domain. In studying for exams, the highest rates were found in relation to causing a problem and willingness to decrease procrastination. In Solomon's study, more than 50% of the students claimed that they were willing to decrease their procrastination in reading assignments, studying for exams, and writing term papers (3).

In this study, we translated the PASS into Farsi and validated it. Because the instrument has been validated in only a few cultures, further studies are required to confirm the factorial structure of the scale. We did not exclude 5 cross-loaded items on the grounds that in the context of the cultural adaptation of an instrument, dropping a cross-loaded item would rather weaken the analysis. In addition, there were theoretical reasons for retaining the cross-loaded items. Hence, we would recommend that in future surveys in Iran, the factorial structure of the scale be reassessed.

5.1. Limitations and Strength

The current study has some limitations. First, it was not possible to assess, measure, and control the precision of the students' responses. Second, the probability of self-censoring might have affected the results. Although we asked the respondents not to disclose their identities, 20% of them failed to expose their mean scores of the previous term exams. The last limitation was the high number of the items of the instruments, which is a common problem in the instrument adaptation process. The major strength of the study is its sample size. Given 10 subjects per item, our sample size would be 280. Moreover,

the fact that the scale provided a scenario about procrastination may have prevented recall bias.

Overall, the Farsi version of the PASS is a valid and reliable instrument to measure academic procrastination. Be that as it may, the construct validity of the scale should be assessed in future studies. Academic procrastination was prevalent among the medical students of Sabzevar university of medical sciences, which calls for appropriate measures and interventions.

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Authors' Contributions

Forough Mortazavi wrote the proposal, collected the data, and wrote and revised the final draft. Razieh Khosrorad contributed to the study design. Saideh S. Mortazavi compared the Farsi version, the translated version and the original version of the instrument, and edited the final draft.

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References

1. Lay CH. At last, my research article on procrastination. *J of Res in Personality.* 1986;**20**(4):474–95.
2. Ferrari JR, Ozer BU, Demir A. Chronic procrastination among Turkish adults: exploring decisional, avoidant, and arousal styles. *J Soc Psychol.* 2009;**149**(3):402–8.
3. Solomon LJ, Rothblum ED. Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology.* 1984;**31**(4):503–9.
4. Ferrari JR. Procrastination as self-regulation failure of performance: effects of cognitive load, self-awareness, and time limits on ?working best under pressure? *Eur J Pers.* 2001;**15**(5):391–406.
5. Harriott J, Ferrari JR. Prevalence of Procrastination among Samples of Adults. *Psychol Rep.* 1996;**78**(2):611–6.
6. Milgram N, Marshevsky S, Sadeh C. Correlates of academic procrastination: discomfort, task aversiveness, and task capability. *J Psychol.* 1995;**129**(2):145–55.
7. Milgram NA, Batori G, Mowrer D. Correlates of academic procrastination. *J of School Psych.* 1993;**31**(4):487–500.
8. Scher SJ, Ferrrari JR. Toward an understanding of academic and nonacademic tasks procrastinated by students: The use of daily logs. *Psych in the Schools.* 2000;**37**(4):359.
9. Ozer BU, Ferrari JR. Gender orientation and academic procrastination: Exploring Turkish high school students. *Individual Differences Res.* 2011;**9**(1):33–40.
10. Onwuegbuzie AJ, Collins KM. Writing apprehension and academic procrastination among graduate students. *Percept Mot Skills.* 2001;**92**(2):560–2.
11. Lee E. The relationship of motivation and flow experience to academic procrastination in university students. *J Genet Psychol.* 2005;**166**(1):5–14.
12. Ozer BU, Sackes M, Tuckman BW. Psychometric properties of the Tuckman Procrastination Scale in a Turkish sample. *Psychol Rep.* 2013;**113**(3):874–84.
13. Rosario P, Nunez JC, Salgado A, Gonzalez-Pienda JA, Valle A, Joly C, et al. [Test anxiety: associations with personal and family variables]. *Psicothema.* 2008;**20**(4):563–70.
14. Lakshminarayan N, Potdar S, Reddy SG. Relationship between procrastination and academic performance among a group of undergraduate dental students in India. *J Dent Educ.* 2013;**77**(4):524–8.
15. Madhan B, Kumar CS, Naik ES, Panda S, Gayathri H, Barik AK. Trait procrastination among dental students in India and its influence on academic performance. *J Dent Educ.* 2012;**76**(10):1393–8.
16. Jowkar B, Delavarpur M. Relationship between procrastination and goal orientation. *J of new education ideas.* 2006;**5**(3):61–80.
17. WHO Collaborating Center for Mental Health . Psychiatric Research Unit. WHO (Five) Well-Being Index. In: WHO Collaborating Center for Mental Health, editor. Hillerød: 1998.
18. de Wit M, Pouwer F, Gemke RJ, Delemarre-van de Waal HA, Snoek FJ. Validation of the WHO-5 Well-Being Index in adolescents with type 1 diabetes. *Diabetes Care.* 2007;**30**(8):2003–6.
19. Bonsignore M, Barkow K, Jessen F, Heun R. Validity of the five-item WHO Well-Being Index (WHO-5) in an elderly population. *Eur Arch Psychiatry Clin Neurosci.* 2001;**251 Suppl 2**:II27–31.
20. Mortazavi F, Mousavi SA, Chaman R, Khosravi A. [Validation of the World Health Organization-5 Well-Being Index; assessment of maternal well-being and its associated factors]. *Turk Psikiyatri Derg.* 2015;**26**(1):48–55.
21. Ferrari JR. Reliability of academic and dispositional measures of procrastination. *Psychological Reports.* 1989;**64**(3c):1057–8.
22. Ozer BU, Demir A, Ferrari JR. Exploring academic procrastination among Turkish students: possible gender differences in prevalence and reasons. *J Soc Psychol.* 2009;**149**(2):241–57.
23. Lawshe CH. A Quantitative Approach to Content Validity. *Personnel Psych.* 1975;**28**(4):563–75.
24. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res Nurs Health.* 2007;**30**(4):459–67.
25. Shrive FM, Stuart H, Quan H, Ghali WA. Dealing with missing data in a multi-question depression scale: a comparison of imputation methods. *BMC Med Res Methodol.* 2006;**6**:57.
26. Stinson JN, Petroz GC, Stevens BJ, Feldman BM, Streiner D, McGrath PJ, et al. Working out the kinks: testing the feasibility of an electronic pain diary for adolescents with arthritis. *Pain Res Manag.* 2008;**13**(5):375–82.
27. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin.* 1980;**88**(3):588–606.
28. Rahmati Najarkolaei F, Raiisi F, Rahnama P, Gholami Fesharaki M, Zamani O, Jafari MR, et al. Factor structure of the Iranian version of 12-item general health questionnaire. *Iran Red Crescent Med J.* 2014;**16**(9):e11794.
29. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary J.* 1999;**6**(1):1–55.
30. Waltz CF, Strickland OL, Lenz ER. *Measurement in Nursing and Health Research.* 4 ed. Berlin: Springer; 2010.
31. Onwuegbuzie AJ. Academic procrastination and statistics anxiety. *Assess Eval High Educ.* 2004;**29**(1):3–19.
32. Klassen RM, Kuzucu E. Academic procrastination and motivation of adolescents in Turkey. *Edu Psych.* 2009;**29**(1):69–81.