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A New Scale to Investigate University Students' Problems: The Development and Psychometric Properties of the Problem Field Scale for University Students

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Abstract

The aim of the present study was to develop a new brief scale so as to determine university students' problems. Additionally, it was aimed to explore the psychometric properties including factor structure, reliability and validity analysis of the Problem Field Scale (PFS). The data were collected from 218 university students. The age of the participants ranged between 17 and 25 years, with a mean age of 19.9. The results of the study suggested four-factor subscales for PFS. Factor structure of PFS was examined by means of exploratory and confirmatory factor analysis. In general, the PFS demonstrated adequate model fit, showed strong internal consistency and correlated with the PFS subscales. In total, the findings support that the PFS is a valid and reliable measure of determining university students' problems. This measurement can be considered crucial in the identification of university students' problems so that prevention and helping strategies can be developed to handle serious problems.

Keywords: University students, scale development, psychometric properties, reliability, validity

The subject of exploring university students' problem areas began to take attention from 1980s. During the university preparation process, there appear many psychological, physical and emotional problems due to the several factors as exposing family pressure and perfectionist parents' attitudes, comparing with peers consistently. Adolescents who put off to solve their problems trend to cope with them in university atmosphere. Great number of difficulties may occur in university life as well as at the end of adolescence, which was accepted as crucial phase toward adulthood (Kacur & Atak, 2011). Achieving university entrance exam is much more valuable concern for young adulthood that is a time ranging from about 19 to 30. University students, who are young adults, are individuals having developmental problems and feeling distresses of transition period from adolescence to adulthood. According to Ericson (1963), individuals in this psychosocial stage have to obtain the regulation ability of their identity with regard to the social environment and other people while maintaining their sense of individuality (Feist & Feist, 2006).

In contrast, most of students who earned a right to apply for a specific license program by coming through the complexities can run across lots of difficult situations like adopting the university life also admitted as the most tempestuous developmental stage on account of mental structure, meeting and performing expectations planned previously, embracing their programs, living together with other in diverse conditions (home, dormitory), managing effective their use of time (Ceyhan & Ceyhan, 2011). Difficulties faced in case of overcoming with test anxiety, academic competition, achievement assessment system, relationships among peers, classmates and lecturers, the adversities of lessons, academic works and personal needs becomes maladaptive stressors for university students (Perrine & Lisle, 1995). Additionally, consistency disorders are very common observed among university students because of emotional and social features (İnanç, Savaş, Tutkun, Herken, & Savaş, 2004).

The university period, which constitutes an important part of life and is initiated only after psychosocial life crisis as adolescence, is required to search and elaborate comprehensively. Because of the fact that students coming to university encounter the authentic life and environment, this period becomes a serious research subject with its multidimensional unstable structure. From this view, university students' needs, problems, individuality developments, the adaptation processes, vocational attitudes are demanded to investigate and to share results with all curators and them (Özbay, 1997). Familial and economic problems, difficulties in expressing thoughts, fears about employment after their education, respectively, are signified as the most important problems for them. As the family

structure is inquired again during the university years, familial problems are seen so much than economic troubles (Bilgin, 2001). Moreover, they have a lot of ideals for not only school years but also their future particularly vocational life. Therefore, academic issues for university students including achievement expectations, views of lecturers, employment, obtaining abilities required for vocation may become crucial. Özdemir (1985) demonstrated that the most highlighted problems from students were related to school and achievement. Additionally, girls had more diverse problems, which were interrelated to future anxiety, familial atmosphere and dating attitudes, than boys in terms of variety and quantity. For all that, most of the students exhibited various indications as insouciance to lessons, decrease in academic achievement, depressive feelings, fast anger, eating and sleeping disorders. As a conclusion, it was indicated that student having problems related to family, academic, and vocational patterns displayed more depressive and neurotic symptoms.

According to Özbay (1997) reasons that forced students to prepare for university entrance exam gave rise to be occurred most of the academic difficulties. Acquiring a job, developing individuality, being free by leaving family, getting a status and conducting academic research are not the real reasons to entre university exam. The real reasons were thought within three dimensions involving psychological, economic, and social issues. Researches in determining university students' problem field and needs indicated that students faced various psychological problems and required to external support (Erkan, Özbay, Cihangir-Çankaya, & Terzi, 2012; Soliman; 1993). As it can be seen clearly especially in last years, increasing students quantities in campuses, academic, social, individual and vocational problems are essential events to develop actions provided frequently by counseling and guidance services in order to examine their problems and needs correctly (Bishop, Bauer, & Becker, 1998; Gallagher, Golin, & Kelleher, 1992; Gizir, 2005).

As seen in conducted studies university students possess many problems that are qualified as individual and that are relevant to peer and family relationships as well as academic difficulties (Erkan et al., 2012). These problems make university students look for help. Occasionally, students may be sufficient to solve their problems by themselves. However, they may need formal or informal external support provided by experts, peers, parents, and lecturers from time to time (Nadler, 1990; Rickwood, 1995). Therefore, determining university students' problems is very crucial so as to supply contribution to developing psychological help systems. On the other hand, it is not possible that we can say researches on young adults educating university with respect to the provided opportunities for

their needs are adequate. Furthermore, psychological help services needed to provide in university level is limited and it can be said that these services do not work as expected since there is lack of studies on this important subject (Koç, Avşaroğlu, & Sezer, 2004). In addition, using qualified instruments to investigate their problem areas is considered as the most handicapped matter to carry out such studies. Although there are so many researches based on university student's problem areas in Turkey (Cihangir et al., 2007; Erkan et al., 2012; Kaygusuz, 2002; Türküm, Kızıltaş, Yemenici, & Bıyık, 2004; Ültanır, 1998; Yazçayır & Ersay, 2011), it is felt that the lack of qualified tool to measure their problems restricted following studies. As the inadequate applications on determining university students' problems are limited the helping services to them, these situations can be interpreted as two tailed.

In the light of theoretical background above, our aim in the present study was to report a study supporting the psychometric strength of a new brief scale, including the factor structure, reliability, and validity analysis, designed to examine university students' problems.

Method

Research Design

The present study aimed to develop a new scale so as to determine university students' problems and to exhibit its psychometric properties with exploratory and confirmatory factor analysis. Item development, content validity, structural validity and reliability analysis were respectively conducted in the scale development process.

Participants

Two hundred and eighteen undergraduate students at a northeastern university in Turkey were sampled for this study. The sample was composed of 132 females (%60.6) and 86 males in age from 17 to 25, with a mean age of 19.9 years (SD = 1.48).

Research Instrument

The problem field scale was designed as a short instrument to define university student's problems. Item on the scale were written to assess individual's attitudes and thoughts toward social competence, body image, academic life and family structure. Item

construction for the scale began by examining relevant literature and other instruments about university students' problems. We generated a pool of 46 items.

Procedure

During the data collection stage, it was provided that the requisite permission was granted from lecturers. Lecturers who were familiar with the research process administered the instrument to students during regular class sessions. Each participant was given an instrument including 46 items, and a demographic questionnaire. Data collection stage completed within 15 minutes. Before data analysis, incomplete and carelessly completed forms were eliminated and responses from 218 remaining students were analyzed. Lisrel 8.51 and SPSS 17 were used for data analysis.

Results

Content Validity

Content validity was evaluated by three experts, who earned their PhD, on human behavior. After expert investigation it was decided that no item was discarded and the necessary corrections were made. Finally, 46 items were formatted with 7-point Likert scales ranging from 0 (not at all like me) to 6 (completely like me).

Item analysis

Item analysis is an investigation process in which students' responses to items are analyzed to determine what extend each item is sufficient to measure the participants' attitudes (Everitt, 2006). Two separate analyses were employed to fulfill item analysis. Firstly, the differences between mean scores of the upper 27% and lower 27% were calculated for each item by conducting the independent t test. The t test results demonstrated that there are significant differences between each items' means of the upper 27% and lower 27% points (Henson, 2006). Secondly, the item-total correlation was applied to identify problematic items of whole scale. In the light of literature (Field, 2005; Nunnally & Bernstein, 1994) ,we agreed to the criterion of .30 as the cutoff item-total point. Based on the criterion three items (8, 30, 42) were eliminated due to the insufficient correlation coefficient between the sum score of the items and item. After the elimination process, as it can be seen from Table 1, item-total correlations ranged from .36 to .63.

Exploratory factor analysis (EFA)

In factor analysis process, Kaiser-Meyer-Olkin (KMO) and Barlett Sphericity test were required to analyze in order to determine whether the items were suitable for factor analysis (Field, 2005). The KMO value was found to be 0.83 and Barlett's Test of Sphericity was found to be significance ($x^2_{(276)}$ = 2231.30, p<.001). Both of these results indicated that the number of participants was big enough and the data were appropriate to the factor analysis (Leech, Barrett, & Morgan, 2005).

Table 1
Item-total score correlations, differences between mean scores of the upper 27% and lower 27%

Item	r_{tt}	t	Item	r_{tt}	t	Item	r_{tt}	t
1	.37	22.89***	17	.57	13.43***	33	.45	54.46***
2	.39	29.45***	18	.48	28.60***	34	.56	26.67***
3	.42	19.39***	19	.55	14.76***	35	.46	33.27***
4	.40	25.82***	20	.49	27.55***	36	.43	64.84***
5	.53	27.83***	21	.55	27.43***	37	.48	61.94***
6	.50	26.16***	22	.56	27.92***	38	.51	50.85***
7	.42	37.85***	23	.57	14.59***	39	.49	41.79***
8	.24	86.37***	24	.58	11.93***	40	.46	27.61***
9	.36	25.97***	25	.63	20.32***	41	.49	31.13***
10	.50	38.63***	26	.56	23.93***	42	.29	104.56***
11	.39	36.51***	27	.38	25.33***	43	.43	27.53***
12	.58	24.08***	28	.36	11.62***	44	.41	32.19***
13	.55	21.33***	29	.42	7.07***	45	.46	44.08***
14	.49	14.69***	30	.27	72.44***	46	.40	33.33***
15	.53	27.50***	31	.39	26.51***			
16	.56	15.18***	32	.39	68.88***			

***p<.001, r_{tt}: Item-total score correlation coefficient

An exploratory factor analysis was (EFA) conducted using maximum likelihood estimation. The 43 items from the pool were analyzed. Results from maximum likelihood analysis with a direct oblimin rotation revealed twelve factors explaining 68% of total variance. During the EFA a factor loading value of .30 was accepted as a criterion for the retention of items (Hair, Anderson, Tatham, & Black, 1998). Therefore, 16 items from the pool were excluded. Because of the fact that the scale was aimed to explain university students' problems within four factors, the factor number was cited to four intentionally and the analysis was reiterated with 30 items. In addition, 6 items which had a low factor loading were eliminated. Finally, the 24 items retained from the pool of 46 were chosen to reflect university students' problems. The four factors accounted for 53.77% of total variance and factor loadings ranged from .40 to .88. Based on the content of the factors, Factor 1 was

labeled "*Body Image*", Factor 2 "*Family Structure*", Factor 3 "*Social Competence*" and Factor 4 "*Academic Life*".

Finally, corrected item-total correlations were evaluated. Results indicated that corrected item-total correlations ranged from .38 to .61. The related results of corrected item-total correlations were summarized in Table 2.

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Table 2
Means, standard deviations, factor loadings and item-total score-corrected correlations

Item	Factor Loadings				M	SD	r_{tt}
	Factor 1	Factor 2	Factor 3	Factor 4			
15	.84				.94	1.66	.61**
12	.83				.89	1.61	.59**
13	.80				.72	1.42	.60**
14	.79				1.43	1.90	.55**
16	.49				1.47	1.92	.51**
9		.88			1.22	1.74	.57**
10		.84			.88	1.64	.49**
8		.78			1.33	1.79	.56**
11		.64			1.62	1.86	.53**
7		.45			2.07	2.14	.38**
22		.40			1.62	2.02	.41**
4			.79		1.60	1.87	.61**
5			.75		1.37	1.77	.55**
1			.74		2.19	1.98	.44**
3			.68		1.40	1.86	.48**
6			.63		2.26	2.10	.49**
2			.45		1.10	1.87	.43**
21				.76	2.16	2.04	.52**
18				.76	2.91	2.12	.47**
20				.74	2.31	2.16	.57**
19				.69	3.05	2.07	.50**
17				.47	2.89	2.14	.38**
24				.46	2.25	2.03	.45**
23				.43	1.95	1.98	.44**
Eigenvalues	6.43	2.36	2.17	1.93			
53.77%	26.81%	9.83%	9.07%	8.04%			

**p<.01, M: Mean , SD: Standard Deviation, r_{tt}: Item-total scale-score-corrected correlation coefficient*

Confirmatory factor analysis (CFA)

The 4 factor model was tested using confirmatory factor analysis by means of Lisrel 8.51 in order to further examine the factorial structure. To what extent the model account for the data was established with the fit indices. In a general manner fit indices values enable researchers to accept or refuse the model. We reported results for several fit indices as follow: x2/df , RMSEA (Root Mean Square Error of Approximation), CFI (Comparative Fit Indices), IFI (Incremental Fit Index), GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index), NFI (Normed Fit Index), NNFI (Non-Normed Fit Index), RFI (Relative Fit Index) SRMR (Standardized Root Mean Square Residual). General agreements are that x2/df values of 2 or lower and CFI, IFI, GFI, AGFI, NFI, NNFI, RFI values of .90 or greater indicate satisfactory fit; RMSEA and SRMR values of .05 or lower show excellent fit (Çokluk, Şekercioğlu and Büyüköztürk, 2010; Kline, 2005).   After the required and suggested modification indices (21-20, 13-12, 24-23, 24-17, 16-15) which were similar in theoretical basis were applied to improve the model, results of the first order confirmatory factor analysis

indicated that the model was adequate fit to the data: $x^2_{(241)}$= 369.03, p<.001; x^2/df = 1.53, RMSEA = .04; CFI = .93; IFI = .93; GFI = .88; AGFI = .85; NFI = .84; NNFI = .92, SRMR = .06, RFI = .81. Factor loading of 25 items were presented in Figure 1.
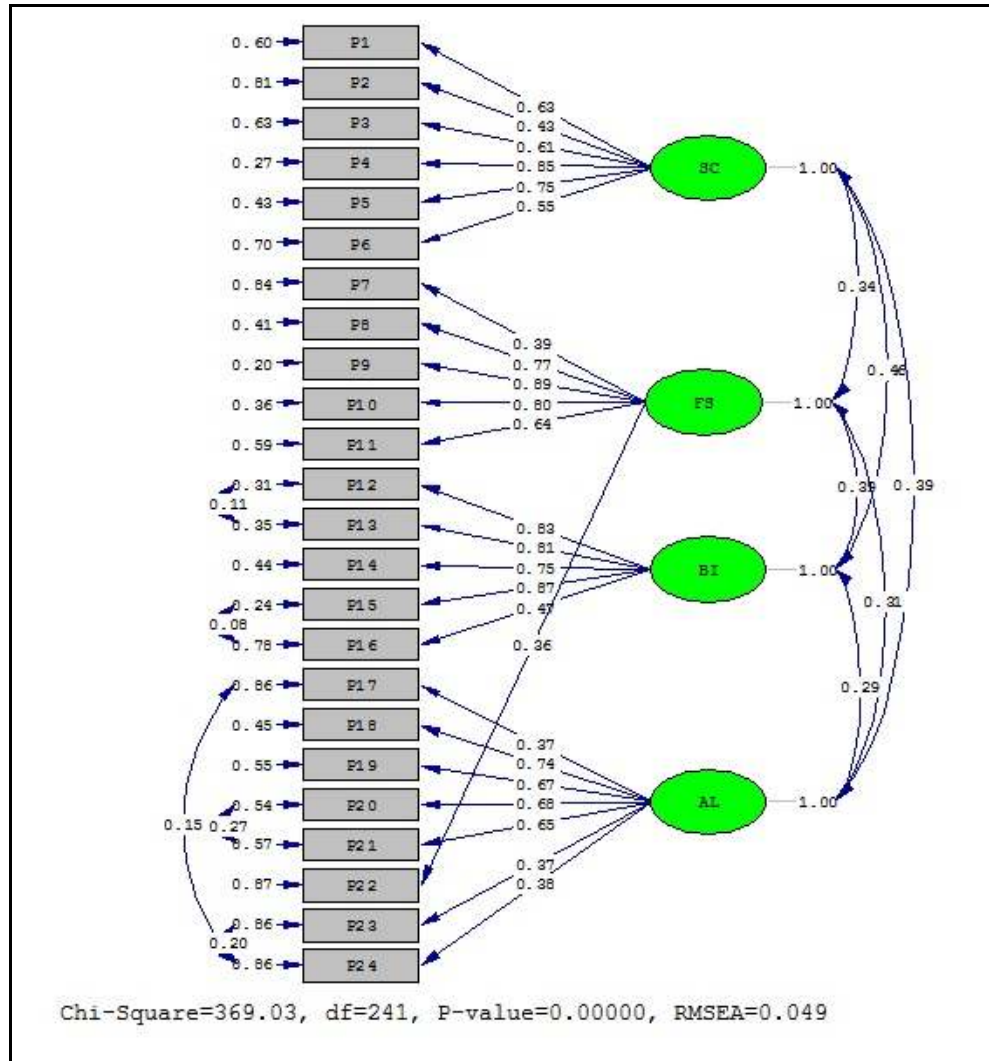

Figure 1. *Factor loadings for the PFS*

Due to the fact that the Problem Field Scale contains four subscales, we agreed to employ second order confirmatory factor analysis. Meydan and Şeşen (2011) focused that second order confirmatory factor analysis must be applied in case of the instruments consist of three or more factors. Results of second order factor analysis showed that the model was sufficient fit to the data: $x^2_{(243)}= 364.45$, p<.001; $x^2/df = 1.49$, RMSEA = .04; CFI = .93; IFI = .94; GFI = .88; AGFI = .85; NFI = .84; NNFI = .93, SRMR = .06, RFI = .82. Results of four factor structure second order factor analysis were presented in Figure 2.
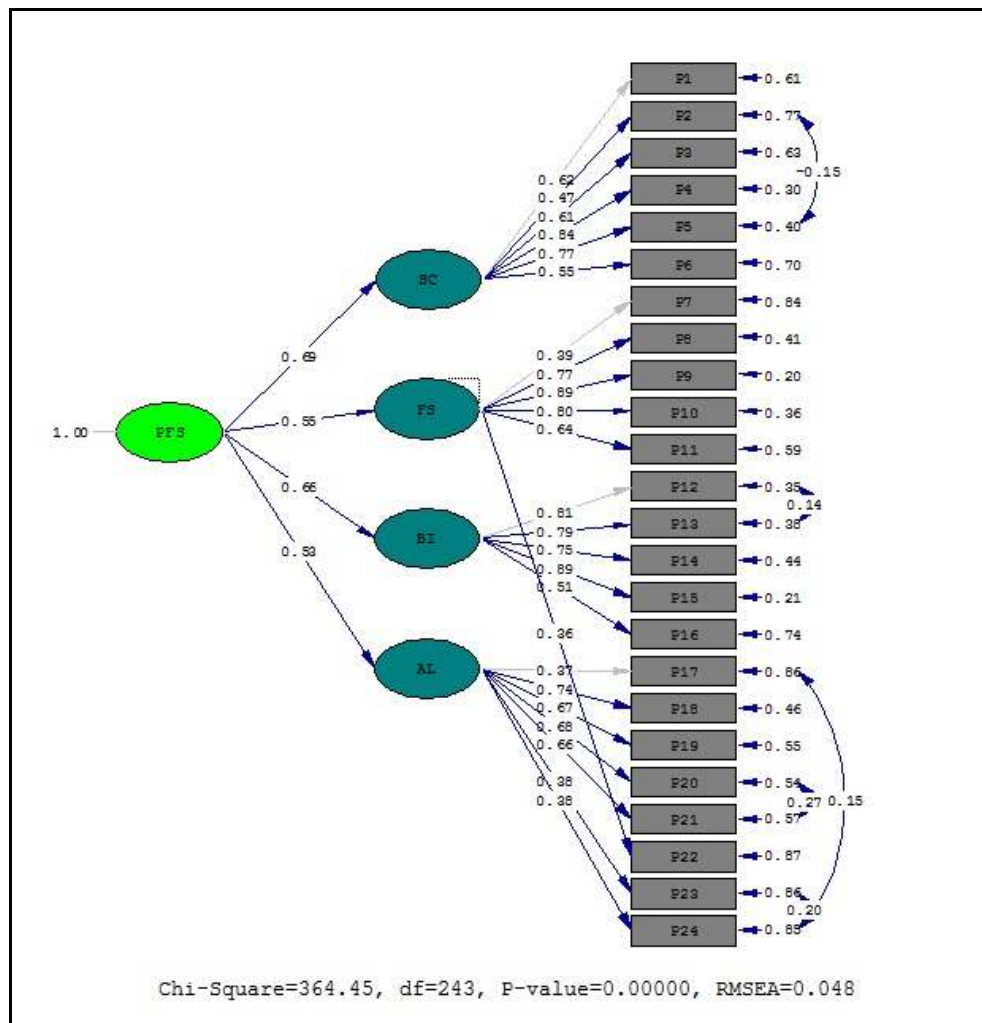

Figure 2. *Second Order Confirmatory Factor Analysis of PFS*

Internal Reliability

The internal reliability was evaluated through the Cronbach's Alpha Coefficient, re-test reliability, and corrected item-total correlations. As presented in Table 3 the Cronbach's Alpha coefficient for the whole scale was found as .87; for the body image subscale was found as .85; for the family structure subscale was found as .79; for the social competence

subscale was found as .80; for the academic life subscale was found as .77. Therefore, it could be concluded that Cronbach's Alpha values demonstrated good internal consistency of the items in the whole scale and four subscales. Moreover, there were statistical significant correlations among subscales. These correlations provided further support for construct validity of entire scale.

Table 3
Internal consistency, means, standard deviations, and correlations among problem fields scale subscales

Scale	Range			M	SD	Correlations				
	α	Min.	Max.			1	2	3	4	5
1.Total Scale	.87	0	105	41.76	23.14	-				
2.BI Subscale	.85	0	28	5.48	6.82	.71**	-			
3.FS Subscale	.79	0	36	8.76	7.86	.70**	.40**	-		
4.SC Subscale	.80	0	36	9.95	8.13	.70**	.40**	.30**	-	
5.AL Subscale	.77	0	41	17.55	9.51	.73**	.33**	.32**	.32**	-

$^{**}p<.01$; *BI: Body Image; FS: Family Structure; SC: Social Competence; AL: Academic Life; M: Mean; SD: Standard Deviation; α: Cronbach's Alpha Coefficient*

Conclusion

The purpose of the present study was to develop and investigate the psychometric properties of scale designed to measure university students' problems. Overall, the PFS appears to be a developmentally appropriate measure with sufficient preliminary evidence for the reliability and validity of its scores. In this study, factor structure of the PFS was examined by means of exploratory and confirmatory factor analysis, respectively. The exploratory factor analysis performed with 24 items retained from initial pool showed that there were four subscales accounted for %53.77 of total variance. Given the minimum total variance criteria as .30 in social sciences, it can be asserted that this scale provides construct validity (Field, 2005). These four factors structure was confirmed by CFA. Results from CFA demonstrated that the factorial model of the PFS was at an acceptable degree of goodness of fit. As reliability coefficient of .70 was stipulated as an acceptable criterion for the internal consistency (Creswell, 2002), the PFS exhibited acceptable reliability coefficients and satisfactory test-retest reliability coefficients. After item analysis, it was determined that the corrected item total correlations supported to the criteria as the cutoff item total point. Therefore, items on scale are most useful for distinguishing among students in terms of assessment standards.

According to results of validity and reliability analysis, it can be concluded that the PFS presented adequate model, demonstrated strong internal consistency and correlated with

the PFS subscales as expected in every case. The PFS is an instrument aimed to assess university students' problems within four subscales entitled as body image, family structure, social competence and academic life. This scale has 24 items, formatted with 7-point Likert scales ranging from 0 (not at all like me) to 6 (completely like me), reflecting university students' problem areas. There are no reverse scored items. Scores of the PFS could be range from 0 to 144. Getting high scores refers that students have great amount of problems.

In present study, there are some potential limitations. A few recommendations were asserted by researchers based on these limitations. First of all, the PFS is still need of further psychometric validation. The present study was conducted in a smaller university located in undeveloped city. In addition, most of students with low socioeconomic status came their university from undeveloped city, too. Hence, problems among university students could be differentiated and increased according as university. This is why investigating of the factor structure of PFS for targeting other students receiving education at different universities should be carried out. In further studies, the number of factors should be increased to determine university students' problems comprehensively. Secondly, test-retest reliability was not carried out owing to the short period of time. For future studies, concurrent validity and reliability should be conducted to support the usefulness of the scale as well as test-retest reliability. Another limitation of present study is that the findings from this research only based on quantitative research approach. We recommend that results should be supported by qualitative data. Researchers who are adapted to qualitative approach should make meetings and observations to supply further information about university students' problems. In the light of above results and university students' problems, psychological help services intended for university students may be employed. In total, the data support that PFS is valid and reliable measure of university students' problems.

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