Original Article

Development and validation of the Willingness to Work with Elderly People Scale (WEPS) among medical sciences students

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ABSTRACT

Background/Objective: As people age the quest for maintaining good health becomes increasingly important. Since students' intention to work with older adults can be used as a valid proxy measure for their future behavior, therefore, a valid and reliable instrument to measure intention is essential for educational intuitions. The present study aimed to develop and validate a scale to measure medical sciences students' willingness to work with older adults.

Methods: A cross-sectional design study was conducted on a sample of Iranian medical sciences students in 2017. The self-administered technique was employed to collect data in the respective departments. The items for the Willingness to Work with Elderly People Scale (WEPS) were developed through a systematic and critical review of the existing literature on willingness to work with older adults using Theory of Planned Behavior (TPB) as a theoretical framework. Data analysis was conducted using SPSS 23.0 for Windows (IBM SPSS Statistics 23.0) and AMOS 23.0 (Analysis of Moment Structure).

Results: Out of 583 students surveyed, 56.4% were male and mean age was 21.98 (standard deviation, SD=3.63) years, ranging from 18 to 48. Internal consistency using Cronbach's alpha for the scale was found to be 0.81. The results provide support for the convergent and concurrent validity of the WEPS. The results from AMOS revealed that final model's CMIN/df (2.646), GFI (0.930), CFI (0.916) and RMSEA (0.053) fit statistics, indicated satisfactory model fit.

Conclusion: The findings from the current study provided the initial evidence that the WEPS produced a reliable and valid scale for measuring the willingness to work with older adults. Future prospective research is needed to determine whether these attitudes and beliefs predict actual work with older adults among students.

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INTRODUCTION

As life expectancy increases and birth rates decline, the world's population is aging rapidly and this demographic transition is expected to continue.[1] With this increased number of older adults, the social and health care systems face a serious challenge to provide support for the aged population.[2] Although a substantial number of older adults will be living healthy,[3] the ageing population is a globally recognized challenge for the social and health care services, therefore, the demand for specialists working with older persons is increasing.[4]

As people age the quest for maintaining good health becomes increasingly important. However, a low level of interest in working with older adults among both faculty and students may complicate training efforts.[5] For example, the results of a study among social work students revealed that 48% of respondents would not be willing to accept a job in gerontology field upon graduation.[5] Similarly, the finding from another study conducted on a sample of first to fourth year undergraduate nursing students, only 5.1% of the respondents ranked aged care as the first preferred career.[2] The findings from a study in University of Aberdeen on medical students revealed that nineteen percent would consider a career in geriatric medicine.[6]

The results of studies indicating working with older adults a less desirable area for future work among students has important implications for educational institutions. It would appear that educational system is not in harmony with increasing numbers of elderly people.[5] Therefore, preparing health and welfare workers to meet the demands of an aging population is a challenging and imperative task for educators internationally.[4,7]

As mentioned above, educational intuitions have the responsibility to prepare students to face trends of increasing numbers of older adults and the demands for aged care and to motivate students to work with older people after graduation, however, there is a growing body of empirical studies suggesting that many students have less intention to work with older adults.[8,9] Therefore, effective gerontological education has become imperative.

Since students' intention to work with older people can be used as a valid proxy measure for their future behavior, some studies used a self-developed single 'yes' or 'no' close-ended question to survey the students' preferences or intention to work with older people.[4,10-14] Seven studies adopted a single question with Likert scale.[15-18] However, a valid and reliable instrument has not been identified.[19]

Self-developed single item instruments have limited ability to give a deeper understanding of student nurses' reasons for working intention. Intention is a multi-dimensional concept which requires more than a single question to elicit a meaningful response or enable researchers to reach conclusions. It is impossible to rely on a single-item response for the measurement of intention. Furthermore, close-ended questions restrict the amount and breadth of information collected. Multi-item scales rather than single-item scales are generally used in studies on preference, to avoid bias or misinterpretation and reduce measurement error.[19,20] Therefore, a valid and reliable instrument to measure intention is essential to generate accurate information. The current study was aimed to develop and validate a scale to measure willingness of medical sciences students to work with older adults.

METHODS

A cross-sectional design study was conducted on a sample of Iranian medical sciences students in 2017. The questionnaires were distributed to 600 students who were selected using the multistage proportional random sampling method in three medical sciences universities in Tehran, Iran. With a response rate of 97.2%, 583 completed questionnaires were collected from October 2017 to December 2017. At first stage three universities were selected out of seven medical sciences universities in Tehran. The selected universities were Tehran University of Medical Sciences, Iran University of Medical Sciences, and Beheshti University of Medical Sciences. In second stage, the required sample was selected following proportional allocation scheme from each university. The self-administered technique was employed to collect data in the respective departments.

Instrument development

The items for this instrument were developed through a systematic and critical review of the existing literature on willingness to work with older adults using Theory of Planned Behavior (TPB) as a theoretical framework. The TBP posits that intention to work with older adults is influenced by attitudes, subjective norms, and perceived behavioral control. The initial scale consisted of 24 items. The initial items were reviewed by expert panel for content and face validity. The expert panel consisted of health professionals with expertise in gerontology and geriatrics. Items were then revised again in discussion with key collaborators. Four items were removed because of low relevance or lack of clarity by expert panel. The items were scored on a 6-point Likert-scale, ranging from strongly disagree to strongly agree.

Pilot study

The Willingness to Work with Elderly People Scale (WEPS) was tested in a small sample of the target population to test the clarity and reliability of all items. The sample group consisted of 25 medical sciences students, of which 60% were female and 40% were male. Results of pilot study showed that all items were clear to students and had good internal consistency (α=0.81).

Ethical considerations

This study was conducted in accordance with the guidelines in the Declaration of Helsinki, World Medical Association (WMA) and approved by the Medical Research Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran (IR.USWR.REC.1396.157). Written informed consent was obtained from all students who agreed to participate after explaining the study purpose.

Data analysis

Data analysis was conducted using SPSS 23.0 for Windows (IBM SPSS Statistics 23.0) and AMOS 23.0 (Analysis of Moment Structure). First, the data were checked for missing

values, outliers, and normality prior to further analysis. Second, Cronbach's alpha test was calculated to determine the internal consistency of the scale and its subscales. Third, the Pooled-CFA (Confirmatory Factor Analysis) was used to test measurement model. Finally, in order to assess concurrent validity of the WEPS an independent samples t-test was conducted to compare the total score of WEPS between students who interested in pursuing work with the elderly upon graduation compared to their non-preferring counterparts.

RESULTS

Out of 583 students surveyed, 56.4% were male and mean age was 21.98 (standard deviation, SD=3.63) years, ranging from 18 to 48. Around 27 percent of the participants were medical students, followed by nursing (20.2%), and rehabilitation students (18.4%). The vast majority of the respondents (84.5%) were undergraduates. The largest proportion of respondents (45.3%,) were second-year students. Table 1 presents sociodemographic characteristics of the respondents.

Normality

The normality was evaluated by assessing the measure of skewness for all items. The absolute value of skewness 1.0 or lower indicates the data is normally distributed. However, for sample size greater than 200, the absolute skewness up to 1.5 is acceptable.[21] Since normality for

all items in the scale is required for structural equation modeling technique, normality for all items was assessed using skewness. The results revealed that all items fulfilled the normality assumption.

Internal reliability

The internal reliability evaluates how strong the items are holding together in measuring the respective construct.[21] Internal consistency using Cronbach's alpha for WEPS was found to be 0.81. The results of Cronbach's alpha for subscales of WEPS have been presented in Table 4.

Concurrent validity

The concurrent validity of the WEPS was assessed using a widely used single item "*Would you be interested in pursuing work with the elderly in a hospital or community setting when you*

Table 1. Demographic profile of the respondents

Characteristics		n	%
Gender	Female	254	43.6
	Male	329	56.4
Marital status	Single	513	88.0
	Married	65	11.1
	Divorced	5	0.9
Field of study	Medical	156	26.8
	Nursing	118	20.2
	Gerontology	16	2.7
	Public health	79	13.6
	Pharmacology	28	4.8
	Rehabilitation	107	18.4
	Dental	24	4.1
	Paramedical	55	9.4
Degree of course	PhD/Medical specialist	15	2.6
	Master	75	12.9
	Bachelor	493	84.5
Year of study	First	116	19.9
	Second	264	45.3
	Third	128	22.0
	Fourth	38	6.5
	Fifth	17	2.9
	Sixth	10	1.7
	Seventh	10	1.7

Table 2. The association between the items and respective latent construct

Items*			Estimate	SE	CR	P value
W5	←	1	1.000			
W4	←	1	0.230	0.084	2.742	<0.01
W3	←	1	0.497	0.088	5.668	<0.001
W2	←	1	0.336	0.079	4.261	<0.001
W1	←	1	0.815	0.101	8.103	<0.001
W10	←	2	1.000			
W9	←	2	0.924	0.146	6.308	<0.001
W8	←	2	0.498	0.119	4.179	<0.001
W7	←	2	0.748	0.138	5.433	<0.001
W6	←	2	0.862	0.105	8.191	<0.001
W15	←	3	1.000			
W14	←	3	1.019	0.089	11.517	<0.001
W13	←	3	0.857	0.093	9.229	<0.001
W12	←	3	1.056	0.094	11.276	<0.001
W11	←	3	0.759	0.087	8.679	<0.001
W20	←	4	1.000			
W19	←	4	1.157	0.083	13.868	<0.001
W18	←	4	1.128	0.063	17.799	<0.001
W17	←	4	1.119	0.066	16.879	<0.001
W16	←	4	1.141	0.066	17.406	<0.001

SE=standard error; CR=critical ratio. *1=attitude; 2=subjective norm; 3=perceived behavioral control; 4=intention.

Table 3. The Fitness Indexes for Measurement Model

Name of Category	Name of Index	Index Value	
		Base Line Model	Final Model
Absolute fit	RMSEA	0.073	0.053
	GFI	0.889	0.93
Incremental fit	CFI	0.837	0.916
Parsimonious fit	CMIN	4.089	2.646

RMSEA=Root Mean Square Error of Approximations; GFI=Goodness of Fit Index; CFI=Comparative Fit Index.

graduate". The result of an independent t-test revealed significant deference (t (581)=2.64, p <0.01) between students preferring work with older adults (mean, M=75.54, SD=10.14) compared to their non-preferring counterparts (M=71.77, SD=9.41).

Convergent validity

The convergent validity was verified using Average Variance Extracted (AVE) and statistically significant of items to the respective latent construct. The value of AVE was computed 0.51 which is large enough to achieve convergent validity.[21] The results revealed, as shown in Table 2, statistically significant associations were found between the 20 items in the measurement model and their respective latent construct.

Construct validity

This validity is achieved when the Fitness Indexes for a construct achieved the required level. The fitness indexes indicate how fit is the items in measuring their respective latent constructs. The CFA using maximum likelihood estimation was performed via AMOS, Version 23 to verify the measurement model. The Comparative Fit Index (CFIs), Goodness of Fit Index (GFI), and Root Mean Square Error of Approximations (RMSEA) were used to determine model fit. Because the Chi-square goodness of fit test is affected by sample size was not used to indicate fit. CFI and GFI values of 0.90 or above, and RMSEA values 0.08 or below are indicative of good empirical fit. The baseline model's GFI (0.889) and CFI (0.837) fit statistics failed to reach recommended values. Therefore, Modification Indices (MI) was checked. The MI indicated that the pairs of 2-3, 6-10, 7-8, 11-13, and 19-20 had high value. We constrained the pairs as "free parameter estimate" and run the new measurement model. Final model's CMIN/df (2.646), GFI (0.930), CFI (0.916) and RMSEA (0.053) fit statistics, indicated satisfactory model fit. Figure. 1 illustrates the final model.

Figure 1 illustrates the output for Pooled CFA. The model consists of four First-Order constructs namely:

1: Attitude towards Work with Elderly People (measured using 5 items)

2: Subjective Norm on Work with Elderly People (measured using 5 items)

3: Perceived Behavioral Control on Work with Elderly People (measured using 5 items)

4: Intention to Work with Elderly People (measured using 5 items)

The pooled measurement model

As the model had more than one latent construct, pooled CFA was conducted. The results of the fitness indexes for measurement model are presented in Table 3. The measurement model for the scale is depicted in Figure 1.

Descriptive findings of the WEPS

The descriptive results of the WEPS are presented in Table
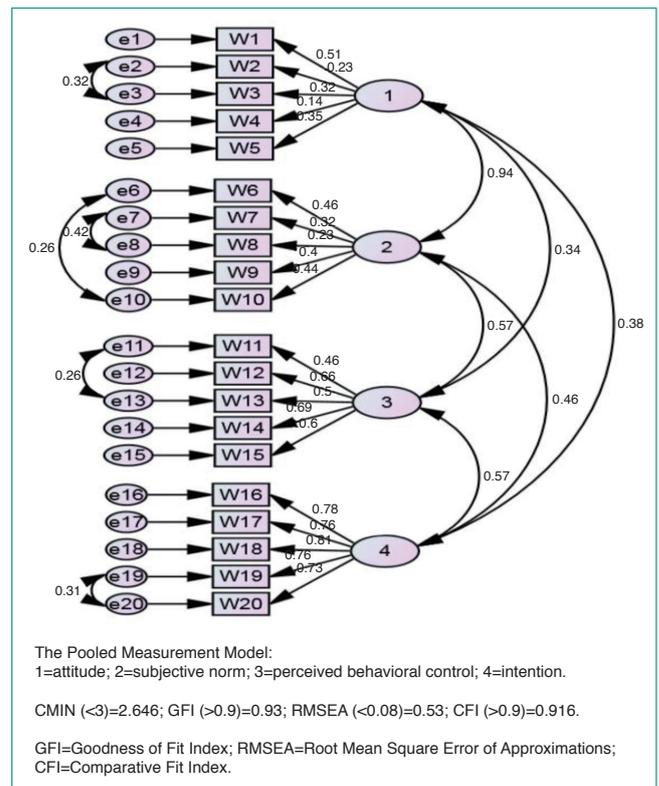
Figure 1. Measurement model using AMOS

The Pooled Measurement Model:
1=attitude; 2=subjective norm; 3=perceived behavioral control; 4=intention.

CMIN (<3)=2.646; GFI (>0.9)=0.93; RMSEA (<0.08)=0.53; CFI (>0.9)=0.916.

GFI=Goodness of Fit Index; RMSEA=Root Mean Square Error of Approximations; CFI=Comparative Fit Index.

Table 4. Descriptive results of the Willingness to Work with Elderly People (WEPS)

Variable	Expected Range		Observed Range		Mean	SD	Skewness	Kurtosis	Cronbach's Alpha
	Min	Max	Min	Max					
Attitude towards work with elderly people	5	30	9.00	30.00	20.45	3.70	-0.14	-0.13	0.54
Subjective norm on work with elderly people	5	30	5.00	27.00	18.17	3.80	-0.38	0.45	0.57
Perceived behavioral control on work with elderly people	5	30	5.00	30.00	15.96	4.63	-0.07	-0.29	0.73
Intention to work with elderly people	5	30	5.00	28.00	17.50	3.24	-0.53	1.36	0.84
WEPS	20	120	35.00	103.00	72.08	9.52	-0.22	0.51	0.81

4. The mean score of the WEPS found to be 72.08 with a standard deviation of 9.52. Of the four subscales, the mean score for the attitude towards work in aged care subscale was the highest (M=20.45 , SD=3.70). The lowest score was observed on the subscale of perceived behavioral control on work in aged care.

DISCUSSION

The present study was conducted to develop and validate a scale namely "Willingness to Work with Elderly People (WEPS)" to measure students' willingness to work with older adults. The WEPS was guided by the Theory of Planned Behavior (TPB).[22] According to the TBP, intention to work with elderly people can be influenced by attitudes, subjective norms, and perceived behavioral control on work with older adults.

Although, Cronbach's alpha for the WEPS was 0.81, its two subscales produced a Cronbach's alpha value of 0.54-0.57. It is noteworthy to mention that according to Nunnally,[23] new developed measures can be accepted with an alpha value around 0.60.

The convergent validity was evaluated using AVE. The evidence showed that convergent validity can be confirmed. The 20-item was determined to be reliable through and CFA. The 20-item, four-factor WEPS was determined to be reliable through CFA. The CFA confirmed that the WEPS can be employed as a measurement instrument to measure students' willingness to work with older adults. The analysis of concurrent validity showed that the WEPS is significantly associated with a widely used single item.[4,18,24]

Compared to previously developed questionnaires[25,26] based on TPB, the WEPS may be more comprehensive and accurate for assessing willingness to work with older adults. For example, Ben Natan and colleagues[26] developed a four-item 6-point Likert scale to measure nursing students' intention to work in geriatrics based on TPB. They used the content and face validity and internal consistency. Similarly, Soad Hassan[25] developed a 14 items five-point Likert scale based on TPB to measure nursing students' intention to work with the elderly and employed content validity and test-retest correlations. First, the items pool for the WEPS was generated through a systematic and critical review using TPB. Second, the sample for developing of WEPS included all medical and allied health students. Third, the WEPS assessed by different validation procedures.

In conclusion, this study provided the initial evidence that the WEPS produced a reliable and valid score for measuring the willingness to work with older adults. The whole questionnaire of the study including individual items of the WEPS is described in the appendix. Future research is needed to demonstrate additional aspects of reliability and validity. In addition, prospective research is needed to determine whether these attitudes and beliefs predict actual work with older adults among students. This study provides the avenue for the further expansion of the WEPS, which requires additional psychometric testing to develop a more comprehensive scale. Finally, although the scale was developed and validated among a large sample size of medical sciences students, it is suggested that future validation studies include non-medical students and non-professional caregivers.

Limitations of the study

There are some limitations to this study that should be acknowledged. First, the instrument was guided by TPB as a conceptual framework and well captured the domains in TPB, but like any conceptual model, it may not fully capture all important constructs. Second, two factors showed a moderate internal reliability having a Cronbach's alpha between 0.54 and 0.70. Although this can be acceptable for new developed measures,[23] consideration should be given in future studies. Third, the study used a cross-sectional design. Additional validation of the WEPS instrument will necessitate longitudinal studies to predict actual work with elderly people from the willingness to work with older adults.

CONFLICTS OF INTEREST STATEMENT

The authors declare no conflict of interest.

Acknowledgement

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APPENDIX

Demographic characteristics			
Age:			
Gender:	☐ Male	☐ Female	
Marital status:	☐ Single	☐ Married	☐ Divorced
Field of study:	☐ Medical Nursing ☐ Rehabilitation	☐ Gerontology ☐ Paramedical	☐ Public Health ☐ Pharmacology ☐ Dental
Degree of course:	☐ PhD ☐ Medical Specialist	☐ Master	☐ Bachelor
Year of study:			

Willingness to Work with Elderly People Scale (WEPS)							
1-Strongly disagree 2-Disagree 3-Somewhat disagree 4-Somewhat agree 5-Agree 6-Strongly agree		1	2	3	4	5	6
Attitude	Working with the elderly is gratifying						
	*Care of elderly patients is the waste financial resources						
	*Working with aged patients is disappointing						
	*Working with older adults is a dead-end job						
	Working with the elderly is a highly rewarding experience						
Subjective Norm	Caring for the elderly is a human duty						
	My culture encourages me to work with the elderly						
	There is enough encouragement for working with the elderly						
	My professors advise me to consider aged care career						
	Working with elderly people is socially valuable						
Perceived Behavioral Control	I achieve competencies for the care of older patients						
	I have professional competencies in aged care						
	In the curriculum there is enough aged care training						
	I have the skills to work with the elderly						
	I have the necessary capabilities to provide end-of-life care						
Intention	One of my career priorities upon graduation is aged care						
	*I will never consider an aged care job						
	After graduation, I would like to work in community aged care						
	Upon graduation, I would prefer to work with the elderly						
	After graduation, I definitely choose working with older people						

*Reversed items