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Validity of the Snyder's Adult Hope Scale (AHS) among Iranian Women with Breast Cancer

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ABSTRACT

Background: Cancer has experienced an alarming growth in the last two decades and is considered a pressing health problem of modern life. This study investigated the validity of Snyder's Adult Hope Scale (AHS) in Iranian women with breast cancer.

Methods: 177 Iranian women with breast cancer were randomly selected for the present descriptive cross-sectional study. Participants completed a demographic questionnaire and the Persian version of Snyder's Adult Hope Scale (AHS), the DASS-21. The psychometric properties of the AHS were examined using confirmatory factor analysis (CFA) and discriminant validity using analysis of the DASS-21.

Results: The results of CFA showed that the two-factor provided an excellent fit to the data. All items of the loadings delivered a significant factor.

These results are acceptable because the factor loadings of all items were significant, and the factor load of all items other than item 1 is higher than 0.5, indicating the model's optimal fit. There was a significant negative relationship between AHS and DASS-21 scores for anxiety (r=-0.49), depression (r=-0.51), and stress (r=-0.47), indicating acceptable divergent validity.

Conclusion: Snyder's Adult Hope Scale (AHS) can be used as a valid and appropriate tool in clinical and educational settings to assess the hope of women with breast cancer and prepare treatment and prevention programs.

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INTRODUCTION

Cancer has experienced an alarming growth in the last two decades and is considered a pressing health problem of modern life. Its negative effects invariably affect the physical, psychological, social and economic aspects of human life and continue to be of great concern to experts.[1] The breast cancer in women has

been considered as one of the leading causes of mortality in them.[2]

A diagnosis of breast cancer is often perceived as a traumatic, life-changing event and stressful experience. Breast cancer may change the shape of the breasts or require the removal of one or both breasts. Surgery affects women's psychosocial functioning in many ways, including identity, self-confidence, mood, sexual desire, self-esteem, and quality of life.[3] Breast cancer not only affects the person affected, but also the relationships between women and their husbands. Breast cancer also has a devastating effect on the sexual and marital relationships of women and their husbands.[4]

Once diagnosed, breast cancer can lead to death, anxiety and frustration, as treatment can also cause a low quality of life and increase patients' negative feelings and attitudes. Between 20 and 35 percent of women with breast cancer suffer from psychiatric disorders and anxiety at various stages of their disease, regardless of stage or treatment status.[4]

For cancer patients, frustration levels increase due to difficult and lengthy treatments such as chemo-therapy and the belief that the disease is incurable. Many cancer patients experience frustration.[5] Hope is the most common psychological resource following a cancer diagnosis and is a major contributor to recovery, survival, and improved quality of life. This makes it one of the most important aspects of cancer treatment.[6] Hopeful people are generally more positive and maintain better functioning social relationships. These people can effectively manage psychosocial stress by using coping strategies such as reappraisal and problem solving. Therefore, psychiatrists and psychologists have viewed hope as an overall positive expectation of achieving a goal. Cancer diagnosis, treatment, and survival challenges exacerbate psychological sympt-oms in patients to the point where these symptoms may interfere with adjustment to the disease.[7] Hope is also an essential adaptation mechanism in coping with cancer crises and improving patients' physical and mental health.

A study has shown that hope can significantly improve cancer symptoms such as depression, pain, fatigue, and cough in cancer patients.[2] Health care providers need to have guides and tools to help their patients and implement strategies to give them hope.[8] Despite other scales such as the Hearth Omid Scale, we used the Snyder's Adult Hope Scale (AHS) in this study, which is a valid instrument for measuring hope in the general adult population.[9] Luo, Wang, Wang, & Cai,[10] also noted that the existence of AHS as a valid and reliable measure of hope is crucial given the prominent role of hope and its relationship to reasons for living. The Snyder's Hope Scale was developed by

Snyder *et al.* in 1991 and consists of 12 items, eight of which are used.[11]

To our knowledge, no study has examined the psychometric properties of the Snyder's Hope Scale in women with breast cancer in Iran. Consideration of cultural and social factors is a crucial factor in further research on the properties of the Hope Scale. The aim of this study was to assess the validity of the Snyder's Adult Hope Scale (AHS) in Iranian women with breast cancer in order to fill the gap and validate psychological measures while investigating the relationship between hope and psychological distress.

METHODS

A cross-sectional survey based on a comprehensive list of women with breast cancer was conducted in Iran between November 2018 and March 2020, with 177 breast cancer patients randomly sampled. Factor analysis requires a minimum sample that is 5 to 10 times larger than the number of items in the target instrument.[12] The survey was conducted in Iran through the internet. The services available in Iran included Instagram, Telegram, and WhatsApp.

Inclusion criteria

Patients had to be Iranian women with Iranian citizenship. Identification or invasion had to be pathologically confirmed. Participants were asked to answer questions based on their medical records and submit information via Instagram, Telegram, or WhatsApp. Participation was completely non-binding. Patients had to be able to read and write Farsi.

Exclusion criteria

Individuals with a history of cancer or cysts (other than current breast cancer), individuals with a history of hormone therapy under 18 years of age were excluded from the study.

We used the Adult Hope Scale.[13] It includes 12 items, 8 of which are used, while the remaining 4 are lie detectors that are not scored. The scoring system is based on a five-point Likert scale from 1 to 5 (from strongly disagree to strongly agree), with this scale reversed at 3, 7, and 11. The score for each question should be calculated to get the total score of the questionnaire. This scale includes two subscales: Agency Thinking and Pathway Thinking. The pathway is a person's understanding that they can create pathways to achieve their goals, and Agency, which is the idea that they are able to use these pathways. Each subscale contains 4 items. The Agency thinking subscale includes four questions: 2, 10, 12, 9; the Pathways Thinking subscale includes four questions: 1, 4, 7, and 8, and 3, 5, 6, and 11 as lie detectors. Retest reliability was found to be 0.82 over ten weeks.[9] Higher scores mean that the respondent has a longer life

expectancy and vice versa. McDermott *et al.*[14] confirmed the two-factor structure of this scale in college students.

The DASS-21 was used for anxiety, depression, and stress. In 1995, Lovibond and Lovibond created the 21-item scale to assess stress, anxiety, and depression. The scoring system for each item increased from zero to three. The sub-scales and related items were as follows: anxiety, stress, and depression. Brown *et al.*[15] had also reported the validity of 0.77 for the scale. Each component contained seven items, whose final score could be obtained by summing the items' scores. Thus, the score could range between 0 and 21 per subscale. The DASS-21's validity in Iran has been reported as 0.82 using Cronbach's alpha.[16]

The study was divided into two parts: the translation method for the instrument and the cultural adaptation. The second part was used to analyze the psychometric properties and test the validity of the instrument. First, a professional translation team translated the scale AHS into Persian and then applied the back-translation technique in collaboration with the second team, which included two American college professors. The translators worked independently of each other. Finally, a professor of English literature and a number of psychologists were asked to review the scale. In the second phase of the study, confirmatory factor analysis (CFA), reliability, and validity of AHS were investigated. The CFA was conducted to test the factor structure that had emerged in the first phase of the study. Cronbach's alpha was used to assess the reliability of the questionnaire, and convergent and divergent validity were examined to assess the construct validity of the scale.[17,18] Because it is appropriate to use a new sample to calculate the CFA, we collected data from a current sample of women with breast cancer as a second step.

SPSS version 22 analyzed demographic frequencies and calculated correlations between the AHS and the DASS-21. In addition, the CFA model was used. Reliability refers to the consistency and repeatability of an instrument's results. One way to assess the internal consistency of the scale is to calculate the Cronbach's alpha coefficient.[17] The internal consistency of AHS was determined using Cronbach's alpha. To examine AHS, LISREL 8.8 was used for the two-factor structure of the measure. The root mean square error of approximation (RMSEA), normalized parsimony fit index (PNFI), comparative fit index (CFI), incremental fit index (IFI), standardized residual mean square root (SRMR), and normalized fit index (NFI) were evaluated. CFI, IFI and NFI must be above 0.90 for a well-fit model, AGFI above 0.80 for a well-fit model and PNFI above 0.50 for a well-fit model, while RMSEA must remain below 0.08 and SRMR should not exceed 0.09. The Cronbach's alpha coefficient of AHS was also calculated.

RESULTS

The age range was between 20 and 66 years (M=38.18 years, SD=8.66). The mean and Standard Deviation (SD) for AHS was calculated as 28.39 (4.13). Cronbach's alpha for AHS was evaluated as 0.75. A sample of 36 subjects performed temporal stability; the results showed that after two weeks, the re-test and test were measured 0.77 (CI=0.75-0.79).

Table 1. Relationship between AHS with the socio-demographic of sample (N=177)

	%	M	SD	F	p
Educational Status				0.46	0.62
Under diploma	20.33	28.80	4.37		
Diploma	33.33	28.55	4.58		
Above diploma	46.32	28.01	4.23		
Age group				1.11	0.33
≤45	34.46	27.74	3.96		
46-60	41.24	28.54	4..33		
≥61	24.29	28.90	4.12		
Marital Status				2.21	0.028
Married	53.67	27.70	4.11		
Single/widow, divorce	46.33	29.11	4.39		
Tumor Treatment				1.50	0.13
Chemotherapy	54.24	28.80	4.47		
Chemo-radiotherapy	45.76	27.81	4..16		

The results of Table 1. show that there was no significant difference between individuals with educational level (below diploma and above diploma), individuals of different age groups and individuals undergoing chemotherapy and radiotherapy with chemotherapy, but there is a statistically significant difference between single and committed individuals on the expectancy variable.

Table 2. Descriptive indexes for all AHS's items (N=177)

Item	Component	Min-Max	Item's statistics		Item-Total statistics		
			M	SD	V	I.T.	C.D.
Item 1	Pathway Thinking	1-5	3.58	.914	16.34	.33	.75
Item 2	Agency thinking	1-5	3.49	1.00	15.20	.44	.73
Item 3	Lie Detector	Not scored					
Item 4	Pathway Thinking	1-5	3.61	.873	15.67	.46	.72
Item 5	Lie Detector	Not scored					
Item 6	Pathway Thinking	1-5	3.71	.847	15.43	.52	.71
Item 7	Lie Detector	Not scored					
Item 8	Pathway Thinking	1-5	3.53	.784	15.68	.53	.71
Item 9	Agency Thinking	1-5	3.68	.948	15.79	.39	.74
Item 10	Agency Thinking	1-5	3.40	.989	15.50	.41	.73
Item 11	Lie Detector	Not scored					
Item 12	Agency Thinking	1-5	3.58	.914	14.97	.51	.71
Pathway Thinking	-	4-20	14.42	2.38	-	-	-
Agency Thinking	-	4-19	13.92	2.63	-	-	-

Descriptive indicators such as mean and standard deviation on each question are shown in Table 2. The table shows that the highest mean is 3.71 for question 6 and the lowest mean is 3.40 for question 10.

The Kaiser-Meyer-Olkin-test (KMO) was used to determine the sample adequacy for the analysis through CFA. The overall KMO value of 0.75 was above the cut-off value of 0.60.[19]

Bartlett's test for sphericity ($X^2(28)=304.71$, $P \leq 0.001$) indicated that the correlations between items were sufficient to perform CFA, so the results for a two-factor structure are presented in Table 4. These results are acceptable as the factor loadings for all items are significant. The CFA showed that the two-factor structure provides a good fit to the data: sbX2=35.65 ($P \leq 0.01$); SRMR=0.057; CFI =.96; NFI=0.92; IFI=0.96; PNFI=0.59; GFI=0.95; AGFI=0.90; GFI=0.95, RMSEA=0.075. All items of the loadings show a significant factor, as indicated in below. Model Fit Index (N=177) is as elaborated in Table 3.

Table 3. Model Fit Index (N=177)

$_{sb}X^{2*}$	SRMR[†]	CFI[‡]	NFI[§]	IFI[**]	PNFI[††]	AGFI[‡‡]	GFI[§§]	RMSEA[***]
35.65	0.057	0.96	0.92	0.96	0.59	0.90	0. 95	0.075

[*] Model chi-square
[†] standardized root mean square residual
[‡] Comparative fit index
[§] Normed-fit index
[**] Incremental Fit Index

[††] Parsimonious Normed Fit Index
[‡‡] adjusted goodness-of-fit statistic
[§§] Goodness-of-fit statistic
[***] Root mean square error of approximation

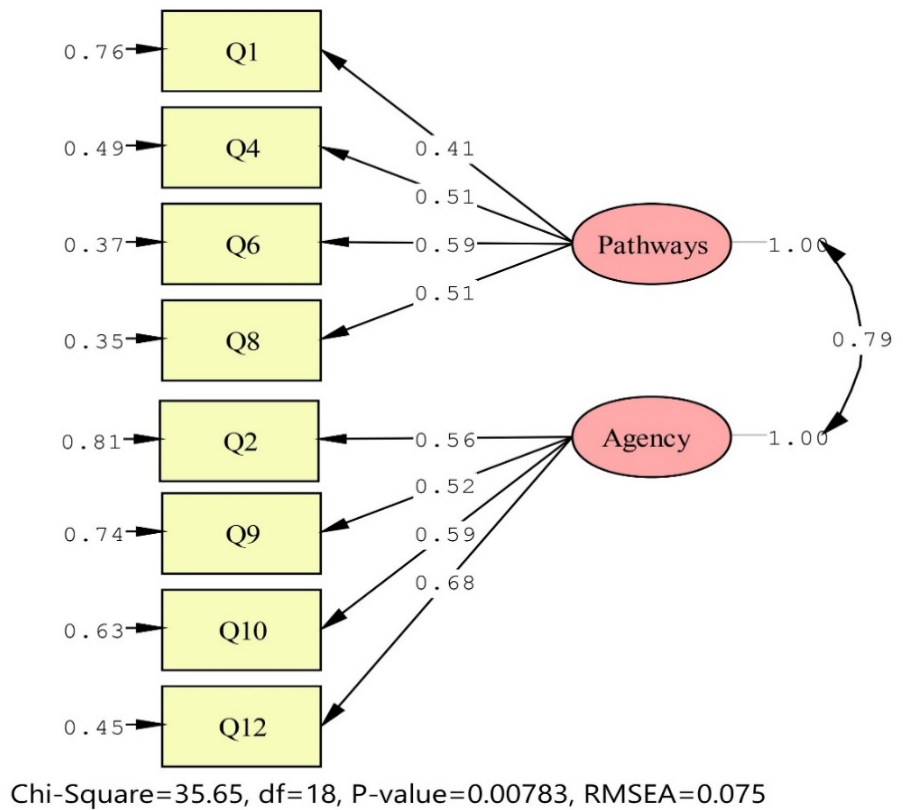**Figure 1.** Results of Confirmatory Factor Analysis of the Adult Hope Scale (AHS)

Chi-Square=35.65, df=18, P-value=0.00783, RMSEA=0.075

Table 4. Standardized factor loading from the confirmatory factor analysis (N= 177)

	Factor loading	
Item	Pathways Thinking (0.78)[a]	Agency Thinking (0.73)[a]
ITEM 1	0.41	
ITEM 2		0.56
ITEM 4	0.51	
ITEM 6	0.59	
ITEM 8	0.51	
ITEM 9		0.52
ITEM 10		0.59
ITEM 12		0.68

Note: a=Cronbach's alpha value

The loading factor for each item and the overall fit index of the model are shown in Figure 1. The factor loading of all items except item 1 is higher than 0.5 and the RMSEA index is less than 0.08, indicating optimal fit of the model.

Regarding divergent validity, we found that the correlations between AHS and the DASS-21 components demonstrated high divergent validity. There was a significant negative relationship between AHS and the DASS-21. These results show acceptable divergent and convergent validity (Table 5).

In this study, the Cronbach's alpha for the subscales of AHS was 0.65 for the Pathways Thinking factor and 0.61 for the Agency Thinking factor. The Cronbach's alpha for the entire scale was 0.75. Based on these results, AHS showed acceptable internal consistency reliability.

Table 5. Pearson's correlation between AHS with DASS-21(n=177)

	AHS	Agency thinking	Pathway Thinking	Depression	Stress	Anxiety
AHS	1					
Agency Thinking	.89**	1				
Pathway Thinking	.86**	.56**	1			
DASS-21, Depression	-.51**	-.45**	-.46**	1		
DASS-21, Stress	-.47**	-.41**	-.36**	.68**	1	
DASS-21, Anxiety	-.49**	-.39**	-.34**	.63**	.59**	1

*P≤0.05   **P≤0.01

DISCUSSION

The psychometric properties of the AHS were examined by CFA using Cronbach's alpha and discrimination validity using the DASS-21. The results show that the scale is valid in Iranian society. No items were removed from the questionnaire and among the demographic variables, only marital status proved to be significant. Research has consistently shown that married people tend to have higher perceived social support.[20] It has been observed that married individuals fare better psychologically than unmarried individuals, which may be due to spousal support. Spouses and partners may encourage female patients to seek medical help and have distressing symptoms treated. Family support is an important factor in breast cancer patients.[21] Therefore, the presence of a spouse as a person who reinforces a sense of love, solidarity, and belonging can influence quality of life, performance, and understanding of support.[22]

According to the results of the present study, the Snyder's Adult Hope Scale (AHS) is negatively related to the DASS-21. Extensive research has consistently shown that cancer patients are highly affected by emotional distress, anxiety, and depression.[23] Depression has a negative impact on the quality of life, length of hospital stay, and treatment outcomes of cancer patients. Cancer causes panic, anxiety and despair.[8]

On the other hand, hope and optimism remain significant predictors of anxiety and depression in patients with oral cavity cancer.[24] Higher levels of hope are also associated with lower levels of anxiety and depressive symptoms in the average population with early stage cancer.[2] One of the causes of psychological distress in patients with breast cancer is fear of the disease and uncertainty about treatment.[25] A focus on enhancing hope increases self-confidence and meaning in life, decreases anxiety and depressive symptoms, and may help patients cope with relapse. Patients who perceive hope as an essential resource in their lives can overcome obstacles and difficulties and continue to battle adverse circumstances. Reducing patients' symptoms can prevent frequent hospitalizations and extremely high economic, social, and psychological burdens on patients, their families, and their communities.[26]

Hope empowers individuals to cope with severe and long-term threats to their physical and mental health. It is noteworthy that hope is a robust adaptive mechanism in chronic patients, including cancer patients. Therefore, hopeful individuals can more easily endure the crises associated with the disease.[27]

Snyder *et al.* considered hope as a placebo in the treatment of physical and mental illness and observed that hope produces positive changes in human physiology.[9,28] The present study suggests that hope may be an important element in cancer patients. Previous studies have shown that hope can be enhanced by psychological health.[29] New tools could be developed to target the hope addressed by Snyder and colleagues. According to Snyder's theory, representational pathways and thinking interact in such a way that focusing on partial goals and successes is likely to lead to increased authority.

Hope plays a critical role in the diagnosis, adaptation, and treatment of fatal diseases, particularly cancer. Because breast cancer is one of the most common cancers, a scale measuring hope levels for this specific population may effectively support treatment selection and improvement at different stages of the disease.

Although the Snyder's AHS has already been validated for the Iranian community, it has not yet been explicitly evaluated for Iranian women with breast cancer. As Iran has a culturally diverse population, women from different cultural backgrounds also have different perspectives on breast cancer and strategies to prevent it.[30] Therefore, ethnic differences were one of the limitations in the present study. Different ethnic groups maintain different beliefs and support systems that can be considered in future studies. Although the

sample size was sufficient for the present study, it does not represent all women with breast cancer in Iran.

CONCLUSION

In sum, it is recommended that researchers, physicians, psychologists, and psychiatrists use this scale for other cancers. It is also suggested that this questionnaire be applied to other potential variables. Another recommendation is to investigate the role of education in women with breast cancer and their perception of hope. Overall, the results of the present study support the use of the Snyder's Adult Hope Scale (AHS) in Iranian women with breast cancer and show that the Snyder's Adult Hope Scale (AHS) is a reliable and applicable tool in research to investigate hope in women with breast cancer in Iran.

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CONFLICT OF INTEREST

There is no competing interest to declare.

ETHICAL CONSIDERATIONS

All research methods involving human subjects were based on the ethical ideals of the National Research Committee, the 1964 Declaration of Helsinki, subsequent revisions, or equivalent ethical standards. Upon return of the survey, all participants signed an informed consent form, and the scales were completed anonymously.

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