

The Role of Academic Experience, Critical Thinking and Cognitive Flexibility in Predicting the Wisdom of Female Postgraduate Students of University of Tehran

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Received June 27, 2021; Revised July 20, 2021; Accepted August 21, 2021

Abstract

Background: Wisdom is considered as a concept based on cognition, deep understanding and insight, reflective thinking and also a combination of considering individual interests in interaction with the interests of others. Therefore, the aim of this study was to investigate the role of academic experiences, critical thinking and cognitive flexibility in predicting the wisdom of Tehran University students.

Methods: This research was a correlational study. Herein, 275 female postgraduate students in 2020 were selected through multi-stage random cluster sampling. In order to collect data, the questionnaires of wisdom, academic experience, critical thinking and cognitive flexibility were employed. Data were analyzed using SPSS-23 software and hypotheses were tested through multiple regression.

Results: The results showed that in academic experiences ($P=0.002$, $\beta=0.13$), critical thinking ($P=0.001$, $\beta=0.19$) and also in cognitive flexibility ($P=0.001$, $\beta=0.57$), the predictors were positive and significant. Also, wisdom and the predictor variables explained 51% of the variance in the criterion variable.

Conclusions: According to the results of this study, academic experiences, critical thinking and cognitive flexibility play a role in increasing and fostering students' wisdom, as a result of which students can make wise and realistic decisions in the process of solving real life problems.

Keywords: Regression, Wisdom, Academic experiences, Critical thinking, Cognitive flexibility

How to Cite: Kavianfar H, Baezzat F, Hashemi S, Naderi H. The Role of Academic Experience, Critical Thinking and Cognitive Flexibility in Predicting the Wisdom of Female Postgraduate Students of University of Tehran. Women. Health. Bull. 2021;8(4):247-252. doi: 10.30476/WHB.2021.92126.1135.

1. Introduction

Wisdom is a new cognitive construct that has occupied the minds of many researchers in recent years (1). Extensive research from 1990 to 2013 is an answer to why psychologists are important and pay attention to wisdom and its applications in education (2). On the other hand, researchers such as Grossmann and Brienza (3) have also highlighted the cognitive elements of wisdom.

Wisdom is the ability to utilize pragmatic reasoning to face important challenges in life (4) and is the knowledge of when and what strategy or problem-oriented strategy (5). It is used in positive and constructive communication with the environment (6). In cultural-historical analyses and implicit theories such as the Berlin model, the Ardel model and the Sternberg model with regard to seeing wisdom as the final stage and end of human growth and also the place of wisdom in different historical periods (5), it seems

necessary to study the predictors of wisdom to take advantage of its positive consequences.

Academic experiences are a combination of environmental factors emphasizing the promotion of scientific and research quality, critical thinking and other abilities that affect students' learning (6). According to Sternberg and colleagues (7), the dimensions of wisdom are formed when facing challenges which are related to learning processes; thus, the academic environment should provide a context in which the conditions for achieving wisdom are facilitated. That is because wisdom has created a deep understanding of the knowledge of existence and its environment (8), has a significant relationship with education (9), and has the ability for education (10), and also affect the quality of education (11).

Critical thinking was considered by Lyutykh (12), to be the way of thinking rightly; Piaw (13), introduced critical thinking as related to high levels of

cognition. Moreover, Facione (14) believed that critical thinking includes the skills of interpreting, analyzing, evaluating, explaining, self-regulating, and inferring; Sternberg suggested that skills can be developed to cultivate wisdom by including specifics and ways of thinking as prerequisites or components of wisdom in the curriculum (15), in order to facilitate the growth of wisdom.

Cognitive flexibility is the ability to abstract and adapt cognitive strategies to environmental conditions (16). Another research considered the degree to which an individual evaluates the control of conditions as flexibility, the level of which can be changed. It also considered the growth of wisdom as the basis of rationality (17). People with resilient thinking ability utilize alternative strategies (18) and show greater adaptation to the levels of thinking and behavior in response to environmental changes (19). They also reconstruct their frame of mind positively, accept challenging situations or stressful events and have a higher capacity for coping and adjustment (20).

Based on the theoretical foundations and findings of research and based on the mentioned models of wisdom, the combined variables of personality, cognitive, reflective, and emotional characteristics have been mentioned as important antecedent factors of wisdom. Since today the development of cognitive skills is a concern of many educational systems and the effective role of universities in the growth and development of society, it seems necessary that university students have the necessary competence and cognitive ability. Research shows that structural wisdom is very important in the field of education and especially at the university level, so finding its predictors will be very important. The researcher did not find a study that examined the role of these variables in predicting students' wisdom simultaneously. Therefore, considering such a research gap and the role of students and universities in the process of solving real life problems and the importance of wisdom growth and wisdom cultivation dealing wisely with today's complex world, the present study investigates the simultaneous role of academic experiences, critical thinking, and Cognitive flexibility in predicting wisdom.

Hence ,the research hypotheses are:

1 .Academic experience is a positive predictor of wisdom.

2.Critical thinking is a positive predictor of wisdom.

3 .Cognitive flexibility is a positive predictor of wisdom.

2. Methods

This was a correlational study. The statistical population of the study consisted of 275 female postgraduate students (178 master and 97 doctoral) of University of Tehran between January – March 2020, between the ages of 23 and 42 with a mean age of 32.50 (SD=5.21), selected through Morgan table and multi-stage random cluster sampling method. Primarily, all the faculties were divided into three general groups and then one faculty from each group and finally two fields of study were randomly selected from each faculty. In order to collect data, the participants were informed that their participation in the study was voluntary in addition to the fact that their information was confidential and used in this research. The participants in this study, in addition to the demographic profile form, completed the Wisdom Questionnaire, Academic experience, Critical thinking, and Cognitive flexibility. The Data were analyzed by the use of SPSS-23 software and hypotheses were tested through multiple regression. Based on which, academic experiences, critical thinking, and cognitive flexibility were considered as predictor variables and wisdom as a criterion variable.

Research Instruments

Wisdom Scale

Wisdom Scale by Schmit and colleagues (21) contains 21 items and six dimensions. They reported the validity via favorable factor analysis method and its reliability was obtained by Cronbach's alpha method which was 0.89. This coefficient was reported for each of the dimensions including reflection=0.82, openness=0.82, interactive=0.65, practical=0.77, contradiction=0.85, and experience=0.84. Akbari and colleagues (22) applied factor analysis and correlation methods to evaluate the validity of the scale. The reliability of the scale was also obtained with the Cronbach's alpha method and retest method. The total reliability was 0.78 and the obtained coefficient for each of the reflective dimensions was 0.75, openness=0.73, interactive=0.71, practical=0.74, contradiction=0.80, and experience=0.75

Academic Experience Scale

The 75-item questionnaire by Pace and Kuh (23) includes three components: the quality of student

effort, the quality of the college environment, and social cohesion. The validity of the questionnaire was reported with the desired item analysis method. The validity of the questionnaire subscales ranged from 0.77 to 0.90. Its reliability was obtained by calculating Cronbach's alpha coefficient for the whole questionnaire of 0.82 and for subscales between 0.61 and 0.80. Karimi (24) examined the validity of the scale employing factor analysis and correlation. The reliability of the scale was also obtained using Cronbach's alpha coefficient and retest method. We reported Cronbach's alpha coefficient to be 0.94 for the whole questionnaire and between 0.59 and 0.78 for the subscales.

Critical Thinking Scale

This scale was designed by Ricketts (25), consisting of 33 questions and including the three components of creativity, cognitive maturity, and mental engagement. The validity of the questionnaire was reported through optimal factor analysis method. In order to validate it, Cronbach's alpha method was used, the reliability coefficient for the whole questionnaire was calculated to be 0.86 and for each of the subscales of creativity was 0.79, cognitive maturity=0.75, and mental engagement=0.89. Pakmehr and colleagues (26) obtained the value of correlation coefficient between scores to be 0.54 applying factor analysis and scale validity correlation. Cronbach's alpha method was employed to calculate the reliability and the total test coefficient was 0.70.

Cognitive Flexibility Scale

The 20-item scale by Dennis and Vander Wal (27) includes three components: Alternatives, Controls, and Alternatives to Human Behavior. They reported the test validity in a favorable manner

and calculated simultaneous validities of 0.39 and 0.75. Internal consistency of this questionnaire with Cronbach's alpha method for the whole scale=0.91, control perception=of 0.91 and perception of different options=0.84 and with retest method for the whole scale=0.81, control perception=0.75, and perception of different contexts was obtained to be 0.77. Shareh and co-workers (28) examined the validity of the scale through factor analysis method and reported the retest coefficient of the whole scale as 0.71 and Cronbach's alpha coefficients of the whole scale as 0.90.

3. Results

The current work was conducted to predict the wisdom of female postgraduate students based on academic experiences, critical thinking, and cognitive flexibility. The participants in this study included 275 female postgraduate students with a mean age of 32.50 (SD=5.21). The findings of the present study are represented in the three descriptive sections of information (Table 1), correlation of variables (Table 2), and regression findings of the analysis (Table 3).

Table 1: Descriptive statistics indicators of variables

Variables	Mean (SD)
University Experiences	12.08 (18.71)
Critical Thinking	12.96 (11.31)
Cognitive Flexibility	99.13 (16.11)
Wisdom	76.96 (16.68)

Table 1 demonstrates the descriptive statistics indicators of the research variables.

Before examining the research hypotheses, the correlation between the variables was calculated and the results are represented in Table 2.

Table 2: Correlation between research variables

Variable	1	2	3	4
1 University Experiences	1			
2 Critical Thinking	-0.01	1		
3 Cognitive Flexibility	0.14*	0.51**	1	
4 Wisdom	0.21**	0.48**	0.69**	1

** Coefficients are significant at the level of 0.001

Table 3: Predicting wisdom based on academic experience, critical thinking, and cognitive flexibility

Predictor Variables	Criterion variable	F	P	R	R2	β	T	P
University Experience	Wisdom	95.23	0.001	0.72	0.51	0.13	3.12	0.002
Critical Thinking						0.19	3.83	0.001
Cognitive Flexibility						0.57	11.45	0.001

As Table 2 shows, the variable of academic experiences has a positive and significant relationship with the variables of cognitive flexibility ($P=0.02$, $r=0.14$) and wisdom ($P=0.001$, $r=0.21$). Critical thinking also has a positive and significant relationship with the variables of cognitive flexibility ($P=0.001$, $r=0.51$) and wisdom ($P=0.001$, $r=0.48$). Meanwhile, there is a positive and significant relationship between cognitive flexibility and wisdom ($P=0.001$, $r=0.69$).

To test the research hypotheses, multiple regression method was employed, the results of which are shown in Table 3.

According to the results in Table 3, the sum of predictor variables had a significant effect on the criterion variable ($P=0.001$, $F=95.23$). Additionally, the results of multiple regression analysis indicated that academic experiences ($P=0.002$, $\beta=0.13$), critical thinking ($P=0.001$, $\beta=0.19$), and cognitive flexibility ($P=0.001$, $B=0.57$) were positive and significant predictors of wisdom. To this end, the sum of predictor variables explained 51% of the variance of the criterion variable.

4. Discussion

The purpose of this study was to investigate the predictors of wisdom of female students in graduate school. For this purpose, academic experiences, critical thinking and cognitive flexibility were selected as wise predictors.

The results revealed that academic experience was a predictor of wisdom, which is in line with the findings of Khalaj Amiri and Abolmaali Alhosein (11). In explaining this finding, it can be said that according to the Berlin Wisdom model, the growth of wisdom requires the participation and interaction of a set of factors and processes; Ardel (29) considered wisdom as a concept based in reflective thinking and a combination of considering individual interests in interaction with the interests of others and that wisdom can provide a unique insight into meaningful situations in life. Wisdom can be based on the ability to apply pragmatic reasoning to solve important life challenges (4), know what strategy to utilize in dealing with the problem (5), and establish a positive and constructive relationship with the environment (6).

The results also implied that critical thinking was a predictor of wisdom, which is consistent with the findings of Ardel (15). On the one hand, it can be noted

that wisdom is the ability to evaluate life based on deep and meaningful concepts and wisdom is created through thinking and experience (29), on the other hand, the cognitive index of wisdom comprises the ability and tendency to understand and pay attention to the deeper meanings of life. Hence, so according to Staudinger and Glück (5), the in-depth wisdom index observes life events from a different perspectives; in other words, wisdom is not only a product of knowledge and experience, but something beyond. That is, critical thinking is a different way of looking at things (13), which is a prerequisite for cultivating wisdom as a result of teaching ways of thinking (15).

In addition, the results revealed that cognitive flexibility was a predictor of wisdom, which is in accordance with the findings of Alhosseini and Ferrari (17). Considering this finding, wisdom on the one hand, removes limitations and maintains the balance between conflicting interests (29); thus, it seems that paying attention to this aspect of wisdom is closely related to cognitive flexibility, which means the ability to change cognitive devices in order to adapt to variable environmental stimuli (29). On the other hand, wisdom is the ability to apply pragmatic reasoning (30), to solve important life challenges (4), to use knowledge based on choosing appropriate strategy (5), to establish a positive and constructive relationship (6); therefore, believing that their personal wisdom can grow, they make plans to cultivate wisdom (17).

5. Conclusions

The results of this research shed light on the various factors possibly affecting the growth and development of wisdom. The obtained findings are one of the obvious applications of growing psychological knowledge, identifying, facilitating, and inhibiting conditions, and creating effective educational conditions for cultivating wisdom.

Considering the importance of wisdom as an end point and ideal in human development and its consideration in different historical periods and the role of the university in teaching wise dealing with real life issues, the findings of this study can be considered as theory and practice which are of great importance. As a result, learners at the higher education level should be able to make wise and realistic decisions and deal with real-life issues wisely, given the role of the university in mental development and the complex nature of the problem-solving process. In general, the results could explain part of the wisdom distribution that

has expanded our knowledge of the importance of the studied variables and their relationships. We suggested that the other dimensions be taken into consideration in order to explain the remaining variance of future research. Regarding the effectiveness of wisdom from factors with psychological and environmental roots, applying it by providing some educational protocols is suggested. The present study was performed in acute and critical conditions of COVID-19 pandemic, creating many limitations in the sampling method, direct access to the sample and the number of questionnaires received, which were sent and received only through a link.

Acknowledgment

The researchers of the present study express their gratitude for the sincere cooperation of all participants in this study. This article was taken from the doctoral dissertation of Mr. Hossein Kavianfar.

Ethical Approval

The Research Ethics Committee of the University of Mazandaran approved all research processes and methods in terms of ethical considerations (coded IR.UMZ.REC.1400.023). Written informed consent was obtained from the participants.

Conflicts of interest: None declared.

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