



Original Article

Investigation of the validity and reliability of the Dark Future Scale in mothers of children with intellectual disability

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Abstract

Introduction: Future anxiety is an attitude toward the future with negative emotions and cognition, which is frequently seen in parents of children with mental and physical disorders. It is the basis for most mental and physical disorders. So, early diagnosis can cause prevention and treatment. This study aimed to evaluate the validity and reliability of the dark future scale in mothers of children with intellectual disabilities.

Materials and Methods: This survey study was a cross-sectional and validation study. Sampling was done by random sampling. So, 196 mothers among mothers of children with intellectual disabilities who were studying in special schools in 2019 in Isfahan city, and 109 mothers of normal children were selected and filled out the questionnaire. Content validity, convergent validity, correlation of items with the total score (material analysis), criterion validity and construct validity, test-retest reliability, split-half reliability, and internal consistency were used. Data analyzed through SPSS-24 and AMOS-18 software.

Results: The results showed that the content validity was validated, 0.65 for convergent validity, 0.31-0.74 ($P < 0.01$) for material analysis, significant criterion validity, 0.58 -0.78 ($P < 0.001$) for construct validity, and test-retest reliability, split-half reliability and internal consistency respectively were 0.70, 0.64 and 0.71.

Conclusion: According to the results, the dark future scale is a short tool with significant validity and reliability to measure future anxiety in mothers of children with intellectual disability.

Keywords: Dark Future Scale, Future anxiety, Intellectual disability, Mothers

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Introduction

Dark future refers to anxiety about the future and is a crucial structure rarely mentioned in the research. This study aimed to evaluate the short version of the Future Anxiety Scale (1).

According to Lewin's (1942) definition of the life cycle, the future concept in psychology includes several dimensions: future time perspective, hope, and future anxiety (2). As a reflection on the future, there are two types of attitudes:

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positive and negative. As a result, feeling along with thinking about the future can be hope or anxiety. A negative attitude causes fear of the future, which is the cognitive basis for future anxiety (3). By Zaleski (1996), future anxiety refers to an attitude towards the future with a negative cognitive and emotional process, in which fear is more potent than hope. This fear of future events includes the feeling that dangerous or harmful changes may occur in the future. Any fear refers to the future to some degree, but future anxiety refers to something beyond the approximate perspective, as well as to personal preoccupations with worry or fear of possible or anticipated undesirable changes in the future (2). These persistent negative thoughts themselves predict emotional anxiety and distress (4). In extreme cases, this condition can turn into a panic attack. Referring to other anxiety concepts, future anxiety has more cognitive characteristics than the emotional one, something people seem to be aware of (2).

The erroneous or negative thinking pattern refers to cognitive errors (5), and one dimension of recognizing the content of repetitive negative thinking is its temporal orientation (6). Among the cognitive errors related to the future is an overgeneralization that expects the worst possible consequences for a situation or event and catastrophizing, including believing in the sustainable negative consequences that will occur in the future (5). As a result, cognitive therapies reduce anxiety symptoms by reducing automatic negative thoughts (7). According to Zaleski (1996), the basis of future anxiety is personality traits that determine the way of responding to fear, personal experiences, and the future (2).

Anxiety is defined as an uncertain or undesirable sense of danger perceived as mental stress with physiological changes, but future anxiety is a type of anxiety generally related to concerns about the future (8). Also, it is only the anxiety associated with an increased perception of future adverse events, while in depression, the focus is on repetitive negative thoughts (9).

A future perspective is a relatively constant tendency to focus on the future, thinking about the future, planning, and goal setting (10). Positive and negative future perspectives mean focusing on evaluating the future positively and negatively, respectively (11). Future anxiety is

one of the most fundamental and essential elements of a gloomy future perspective (2).

Worry involves repetitive negative thinking about the future (12) and is imagined as the infrastructure of anxiety (13). Research suggests a significant relationship between anxiety and worry, but this does not mean that the two are always coexistent (2). Future anxiety is a type of anxious worry that involves repetitive thinking about potential future fears, risks, uncertainties, and imagined catastrophes (14). In general, a high degree of future-oriented thoughts may be a symptom of anxiety (15), and anxiety, in turn, is the basis for most mental and physical disorders (16). One of the anxiety disorders is generalized anxiety disorder (GAD), which is directly related to repetitive negative thoughts about the future (17); and many people today suffer from these disorders (18), which can cause disabilities for the individual and society (16). High future anxiety is associated with high manipulative traits and more powerful strategies in the employer-employee relationship, called French and Raven's hard influence tactics (1959). People with high future anxiety are also more pessimistic when predicting solutions to future global problems (2). In another study, parents of children with developmental disabilities were more anxious about the future than parents of healthy children (3). Psychologists are also interested in understanding future anxiety's roots in current political and social processes and events. Persistent fears of terrorism, conflicts between groups and countries, health problems, social inequalities, conditions of minorities, and massive migrations from occupied areas are some of them that raise the question of how accurate the measurement of this anxiety should be to provide constructive and protective precautions and solutions. The ability to control anxiety can also improve the ability to control other disorders (16).

To this end, it must be possible to assess the level of future anxiety at first. This scale is a useful tool for measuring this crucial psychological structure. It also bridges the gap in temporal measurement methods that address only the positive aspects of future perspectives such as optimism and hope. Surprisingly, this negative aspect of the future is overlooked by psychologists, and the Negative Future Scale

developed by Carelli et al. is the only exception. Therefore, the present study was designed to evaluate the Dark Future Questionnaire's validity and reliability in mothers of children with intellectual disabilities.

Materials and Methods

The present study, conducted on 196 mothers of children with intellectual disability and 109 mothers of normal children in Isfahan in 2019, was a cross-sectional survey study with instrumental validation. Children with intellectual disability had previously received a psychiatrist's diagnosis and were attending special schools for students with intellectual disability.

The original version of this questionnaire called Dark Future, which has five items, was first translated into Persian by two psychologists with master's degrees and two English language experts with master's degrees. Then, an agreed translation was given to a translator to be translated into English. The obtained version was compared with the original version, and their compatibility was confirmed.

To conduct this study, mothers who could read and write were selected; the purpose of the study was explained to them; their consent was obtained, and they were assured that the present study was free of any harm or expense and that their information would be protected. Of course, if they wished, they could be informed of the results of their questionnaires. Mothers were allowed to enter the study if one of their children had an intellectual disability and was attending a particular school, had not received a mental disorder diagnosis through a clinical interview, and had completed the questionnaires with their consent. In contrast, mothers with more than one child with disabilities, mothers whose spouses were unavailable to them for reasons such as divorce, or who had a history of mental disorder were not allowed to enter the study. The present study's statistical population consisted of mothers (mean age = 34.19 ± 5.87 , mean years of education = 15.11 ± 3.16) of all 937 children with intellectual disability who were studying in select schools in Isfahan Province. A simple random method was used for sampling. Simple random sampling is a selected sample of the community in which all members have an equal and

independent chance of being selected (19). In the present study, based on the list of students whose schools agreed to participate in the study, 200 mothers were selected, and after a clinical interview by a psychiatrist to ensure their mental health, 196 remained. According to the research literature, the statistical sample was selected; at least 100, 50, and 100 people were required as samples for descriptive study, correlation study (20), and normative studies (21). Seymour Sadman also suggests a survey of 100 people in each of the main subgroups (19). However, to increase the validity of the research, the questionnaires were distributed among 200 mothers. After the clinical interview and removing the incomplete questionnaires, 196 final questionnaires were selected. The views of 5 experts were used to evaluate the content validity; Pearson correlation coefficient was used for convergent validity (Beck Anxiety Questionnaire); correlation of items with the total score was used for material analysis; t-test and exploratory factor analysis were used for criterion validity and construct validity, respectively. Methods of Cronbach's alpha, re-running the questionnaire at 45-day intervals, and having the test was used for internal consistency reliability, test-retest reliability, and split-half reliability. Data were analyzed using SPSS-24 and Amos-18 software.

Research instrument

A) *Dark Future Questionnaire*: This scale is an abbreviated form of the 29-item Future Anxiety Scale (Zaleski, 1996), which includes five items and measures the tendency to think about the future with anxiety, uncertainty, and disaster prediction.

The present scale is a 7-point self-administered Likert scale, where the higher scores indicate more anxiety about the future (0 = completely false, 1 = false, 2 = somewhat false, 3 = I do not know, 4 = to some extent true, 5 = true, and 6 = completely true). It includes items that refer to self and are mostly general, and not related to specific areas of life, except the latter, which refers to realizing a goal. This scale has a test-retest reliability of 0.618 at a significance level of 0.001, reliability of 0.90 and a Cronbach's alpha coefficient of 0.79 in Poland (2), and a Cronbach's alpha of 0.828 in Russia (22).

B) Beck Anxiety Questionnaire: The Beck Anxiety Questionnaire is a 21-item Likert scale with four options for measuring anxiety severity, developed by Aaron Beck et al. (1990). Each item reflects one of the anxiety symptoms experienced by people who have clinical anxiety disorders or are in a stressful situation. The validity, reliability, and internal stability of this test in Iran were measured by Kaviani and Mousavi (2008)

as 0.72, 0.83, and 0.92, respectively, at a significance level of 0.001 (23).

Results

The mean age of mothers participating in the study was 34.19 ± 5.87 and their average academic years were 15.11 ± 3.16 . Other demographic information of the present study is summarized in Table 1.

Table 1. Demographic information

Demographic variables	Components	Number	Percent
Occupational status	Employed	39	19.89
	housewife	157	80.1
Housing status	Land lord	69	35.2
	Tenant	127	64.79
Nativity status	Native	193	98.46
	Non-native	3	1.53

Validity: To determine the validity of this scale, methods of content validity, convergent validity, correlation of items with the total score (material analysis), criterion validity, and construct validity were used. Content validity was measured using the psychologist's and experts' views. The scale was given to 5 experts in this field, and the connection of each item with the structure of the dark future was confirmed based on their opinions. The correlation between the Dark

Future Scale and the Beck Anxiety Scale, which measures similar structures, was used to examine convergent validity. The results showed that the correlation between these two scales is 0.65, which is significant at the level of $P < 0.01$.

Material analysis is another type of validity obtained by examining the correlation between each question's score and the total score. Table 2 shows the moderate to high correlation of all items with the total score at the level of $P < 0.01$.

Table 2. Correlation of items with the total score (material analysis)

No.	Item	Correlation with total score
1	I am afraid that the problems which trouble me now will continue for a long time	0.68
2	I am terrified by the thought that I might sometimes face life's crises or difficulties	0.31
3	I am afraid that in the future my life will change for the worse	0.64
4	I am afraid that changes in the economic and political situation will threaten my future	0.58
5	I am disturbed by the thought that in the future I won't be able to realize my goals	0.74

In the study of criterion validity, 196 mothers with children with intellectual disabilities and 109 mothers of normal children were compared; these two groups were matched in terms of age and educational level. The results can be seen in Table 3. These results show a significant

difference in the Dark Future Scale score between the two groups, and mothers with children who had intellectual disabilities scored higher on this scale. In other words, they were more anxious about the future.

Table 3. Criteria validity: Independent t-test for the dark future scale of mothers of children with and without intellectual disabilities

Group	No.	Mean	Standard deviation	T-statistic	Degree of freedom	P
Mothers of children with intellectual disabilities	196	24.97	4.45	39.82	303	0.001
Mothers of children without intellectual disabilities	109	7.43	1.51	-	-	-

Exploratory factor analysis was used to evaluate the construct validity. For this purpose, the first KMO test was used to evaluate the adequacy of sample size, and then the Bartlett sphericity test was used to examine the correlation matrix of variables; and after confirming its significance, the factor analysis method was used. According to $KMO = 0.69$ and a significance level of 0.001, the sample is sufficient, and the Bartlett coefficient, 157.63, at the level of 0.001 is significant. As a result, there are necessary conditions for factor analysis. According to the results of Table 4, the factor load level of each item with the main factor is an appropriate value of 0.58 to 0.78, and the scale is saturated with one

factor, which explains 64.34% of the variance of the questions.

Reliability: In the reliability study of the present scale, test-retest reliability, split-half, and internal consistency were used. To calculate the test-retest reliability, this questionnaire was performed twice with an interval of 45 days on 60 subjects, and a coefficient of 0.70 was obtained for it, which is a fair amount. The split-half reliability of the present questionnaire (0.64) was also desirable.

Cronbach's alpha method was used to examine the internal consistency. This coefficient for the present scale shows a value of 0.71, which indicates relatively high reliability.

Table 4. Factor analysis of the Dark Future scale

Item No.	Factor load with the main factor
1	0.72
2	0.58
3	0.78
4	0.61
5	0.78
Eigen value	3.218
Percentage of variance explained	64.34

Discussion

Based on the research results on the validity and reliability of the Dark Future Scale on mothers of children with intellectual disabilities, this scale has acceptable validity and reliability. The present study results are in line with those of the research conducted by Zaleski et al. on a significant scale of 2285 adults in Poland. The present study results in exploratory factor analysis to evaluate the construct validity on 196 people indicate the saturation of the scale of a factor that explains 64.34% of the variance of the questions. In a study conducted on 495 participants to build the dark future's significant scale, this value indicates a factor that explains 48.16% of the variance of the questions. Moreover, to determine the convergence validity

of the main questionnaire, the Future negative scale was used, and the Cronbach's alpha value was 0.79, which in the present study was obtained to be 0.65 using the Beck Anxiety Scale. To determine the test-retest reliability, 295 people with a mean age of 48.5 in 1 month answered the questionnaire, and a significant value of 0.618 was obtained. In the present study, with a time interval of 45 days on 60 people, this value was 0.70, which is good. The values obtained in both studies are consistent and have good significance. Also, in the present study, content validity, criterion validity, material analysis, split-half reliability, and internal consistency were calculated, all of which are statistically significant. Despite having low items, this scale has satisfactory validity and reliability in Iran,

and the brevity feature is one of its strengths. The Future Anxiety Scale has been used in most studies, but its length, mainly when used in conjunction with other tools, is time-consuming. Researchers are always looking to gather the most information in the shortest time, and one obvious way is to use shorter scales because it reduces fatigue and boredom and increases the response rate (24). As a result, a present scale is a useful tool for working with people with mental and physical disorders and students during exams or people who face important life decisions (2) and can provide the necessary information to the researchers in the shortest time. According to the results of research on parents of children with developmental disabilities (25), children with developmental delay disorder (26), children with autism spectrum disorders (27,28), children with attention deficit-hyperactivity disorder (29-33), and children with epilepsy (34), parents of children with mental and medical disorders significantly experience a higher level of anxiety due to reasons such as low levels of social support (35), negative beliefs about their children's support and self-efficacy (36), communication problems (37), and behavioral problems and emotional regulation disorders (38). The results of the present study are similar to those in the study carried out by Bujnowska et al. which was conducted by the Zaleski Future Anxiety Scale (FAS1) to assess the anxiety levels of 167 parents of children with developmental disabilities (3). In both studies, parents of children with developmental disorders showed more anxiety about their children's health and meaning of life than typical children's parents. According to studies, children with intellectual disabilities have significant behavioral problems such as social problems, attention problems, aggressive behavior, mental problems, and isolation (39). The Hastings exchange model on the relationship between these children's behavioral problems and parenting stress acknowledges that children's behavioral problems increase parenting stress, and this stress, in turn, leads to further development of behavioral problems in this group of children (26,31). As a result, it can be argued that the behavioral problems of children with mental disabilities are among the most important causes of increased parenting stress. These children usually exhibit challenging behaviors

that parents could not easily cope with (27,40-41). On the other hand, disturbances in children's self-help skills such as eating, sleeping, and emotional regulation (31) and the severity of behavioral symptoms make them more dependent on their parents. This increases the responsibility and duties of parents to monitor and improve the learning of social skills, behavioral adaptation, and prevention of emotional problems of these children and doubles the burden of parenting and subsequent parenting stress (28,37,38) in a way that is increasing emotional management and learning behavior management skills by these children reduces parenting anxiety and stress. (32)

Social factors, such as the care system and short-term and expensive professional interventions, parental influence stress. These children's problems often impose a heavy burden on parents to decide on intensive care (27). Challenges such as the severe shortage of trained professionals and the place of education of children, and the additional financial burden associated with education and medical services are among the adequate government support issues. As a result, social support and government financial support are vital factors in reducing parenting stress (31). Simultaneously, some studies claim that informal support such as family support is more important than proper support (35) and, for example, increases parents' confidence in their parenting skills and their sense of self-efficacy (41). Since reducing maternal self-efficacy increases maternal anxiety (28), improving it plays a vital role in reducing parenting anxiety. Parents who have negative beliefs about their role and ability to support and educate their children and question their competence about their parenting role are more likely to experience anxiety and stress (28, 36). Although financial problems increase child and parent anxiety, factors such as social support and self-efficacy, especially in low-income families, can even neutralize the impact of financial problems (42). On the other hand, raising these children causes social limitations for parents (27). The mothers of these children usually have more substantial anxiety about the future, health, well-being, and the meaning of life, and have pessimism, helplessness, and severe worries about their social relationships. Their inability to

achieve their own life goals may lead to self-evaluation as aimless persons and may lead to anxiety in another form (3). In countries like China, having children with physical or mental disabilities causes shame and guilt to parents, especially their mother and family (31). As a result, a combination of psychological and financial issues is involved in causing parenting anxiety and stress in parents of children with physical or mental disorders (42), and these parents suffer more anxiety and stress than parents of typical children. Consequently, the Dark Future scale's ability to show this difference indicates the high standard validity of this tool. One of the limitations of the present study is the unavailability of these children's fathers to compare the results. Moreover, this study was performed on parents of children with intellectual disabilities, so necessary care should be taken in generalizing the results of the study. Future research is recommended to examine the validity and reliability of this scale in other children with special needs and their parents, especially fathers, sisters, and brothers. Also, in consulting with parents of children with special needs, their

worries and fears about the future should be addressed, and then the treatment process should begin.

Conclusion

Based on the results obtained, it can be acknowledged that the Dark Future Scale is a suitable tool for measuring future anxiety with acceptable validity and reliability; due to its shortness, it is not time-consuming, and this, in turn, increases the questionnaire return rate. As a result, this tool is a useful scale for measuring future anxiety in related areas.

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