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Comparison of psychological distress, emotional regulation difficulties and distress tolerance in pregnant women with and without thyroid disorder

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Abstract

Considering the sensitivity during pregnancy for mother and baby, as well as the importance of investigating and controlling the consequences of thyroid gland dysfunction in pregnant women, the purpose of this study was to compare psychological distress, emotional regulation difficulties, and distress tolerance in pregnant women with and without thyroid gland dysfunction. The research method was causal-comparative. The statistical population was all pregnant women referred to Shariati Hospital and health centers in Bandar Abbas city. From this population, 92 pregnant women - with and without thyroid gland disorder - were selected by purposive sampling method (46 participants with thyroid gland disorder and 46 without disorder). The research tools included: Kessler Psychological Distress Scale (KPDS-10), Emotional Regulation Difficulty Scale (DERS-36), and Distress Tolerance Scale (DTS-15). The data analysis method was a multivariate variance analysis (MANOVA). The results showed that psychological distress and emotional regulation difficulties in pregnant women with thyroid gland disorder are significantly higher ($p<0.01$) than in pregnant women without thyroid gland disorder, and their distress tolerance is lower ($p<0.05$). According to the results, educational and therapeutic plans, individually and in groups, for pregnant women with thyroid gland disorder can be among the strategies of attention of health centers related to the health of pregnant women.

Keywords: *During pregnancy, thyroid gland disorder, psychological distress, emotional regulation difficulties, distress tolerance.*

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Introduction

Based on the World Health Organization report, the mental health problems of pregnant women are considered an important public health challenge and one of the health problems in the world. (Chinchilla-Ochava, Barrigat-Chávez-Pion, Farfan-Labon, Garzella-Morales, Leff-Golman, & Floris-Ramos, 2019; Ma, Wang, Hu, Tao, Zhang, & Shi, 2019). Pregnancy is when significant biochemical and psychological changes occur (Nice Dale & Morton, 2018; Soma-Fili, Nelson-Pearcy, Tulpanen, and Mobaza, 2016). Hormonal changes and metabolic needs are among these changes that have complex effects on the functioning of the thyroid gland (Stagnaro-Green, Ablavic, Alexander, Azizi, Mastman, Negro, et al., 2011). Pregnancy leads to overstimulation of the thyroid (Rodin, Coutant, Vasseur, Bordello, Laboreau, and Roemer, 2005). it causes the enlargement of the thyroid gland by 10% in areas with sufficient iodine and by 20-40% in iodine-deficient areas (Stagnaro-Green et al., 2011).

Thyroid dysfunction is also one of the endocrine disorders that can lead to the following health problems. Physiological symptoms: fatigue, weight gain, weight loss, cold intolerance, heat intolerance, dry skin, dry hair, tremors, muscle cramps, muscle weakness, shortness of breath, palpitations, constipation, menstrual irregularities and infertility. Symptoms of psychological damage: anxiety, depression, anger, progressive forgetfulness and insomnia. (Ladenson, Singer, Ein, Bagchi, Bigos, Levy et al., 2000; Chucker, Bianco, Janclas, & Peters, 2017; Chiovato, Magri, & Carli, 2019). Hypothyroidism and hyperthyroidism are also among the most common thyroid gland disorders (Dore & Velezke, 2005). Also, thyroid hormones have many changes throughout life and can have very serious effects on a person's physical and psychological health (Ramazani Tehrani, Tahidi, Rostami, Asgari and Azizi, 2010; Ramzani Tehrani, Zadeh Vakili, Hashemi, Amoozgar and Azizi, 2011; Li, Li, Wang, Bao, Li, Tian et al., 2021).

In addition to the psychological consequences caused by thyroid gland disorders such as depression and anxiety (Chiovato et al., 2019; Lee et al., 2021), stress and psychological problems can also be effective in the occurrence of thyroid disorders by reducing the strength of the immune system. (Takeshira, Nishihara, Uteyama, Bam, Makato, and Bertolazzo, 2014). In this regard, studies show a significant relationship between mental disorders and thyroid gland disorders (Son, Zupan, Raka, Toth, and Gershengorn, 2009; Chaker et al., 2017; Chiovato et al., 2019).

Meanwhile, psychological distress in pregnant women is a severe clinical concern (Mulgaro, Finaroli, Saita, 2020) associated with chronic diseases, including thyroid gland disorder (Lee et al., 2021). Psychological distress in pregnancy includes perceived stress, and emotional manifestations of anxiety or depression (Belido-Gonzalez, Robles-Ortega, Castellar-Reeves, Diaz-Lopez, Gallo-Valjo, Moreno-Geldo & De Los Santos-Roig, 2019). Epidemiological studies show that stress, anxiety, and depression are related during pregnancy (Ma et al., 2019). A study showed that even 13 to 25 percent of women in high-income countries suffer from psychological distress symptoms. These symptoms appear to be more common in low- and middle-income countries (Holsbosch, Niklijek, Potharst, Mims, Boykhorst, & Pope, 2020).

Many studies show the relationship between psychological distress during pregnancy and

adverse outcomes in pregnant women (Tamfor-Madsen, Campbell, Giesbrecht, Letourneau, Carlson, Madsen, and Dimdijan, 2016). These consequences include Abortion; Premature delivery and weakening of the immune system (Sheshegar et al., 2012); low birth weight of the baby; Delay in neurodevelopment; visual and hearing defects; Disturbance in the formation of a child's secure attachment; autism; impulsiveness; Occurrence of mental disorders in adolescence and adulthood (Engidav, Mekunen and Amogen, 2019); There is an increased risk of psychological distress after childbirth (Urbachta, Kambers and Bandoli, 2020). There is no evidence regarding the relationship between psychological distress and thyroid gland disorders in pregnant women. However, recent studies have shown that people with hypothyroidism have more anxiety and stress than normal people. Also, Liu et al. (2021) showed in a study that psychological distress has a positive and significant relationship with thyroid gland disorder. Another study also showed that psychiatric disorders, especially major depressive disorder, generalized anxiety disorder, panic attacks, agoraphobia, and suicide, are more prevalent in people with hyperthyroidism. Also, Gorkhali, Sharma, Amatya, Acharya, and Sharma (2020) showed in another study that anxiety and depression are more prevalent among patients with thyroid gland disorder, especially in women with lower economic status.

Difficulty in emotional regulation is another variable that seems to be related to thyroid gland disorder, especially in pregnant women. The general concept of emotional regulation is all the internal and external processes of a person that is responsible for monitoring, evaluating and correcting emotional reactions. Thompson, 1994). In fact, emotion regulation strategies are reactions that determine the ways of accepting or coping with stressful situations and unfortunate events (Eschigil, Bazni and Bazinska, 2012). Difficulty in emotional regulation leads to the consequences of psychopathology such as depression and anxiety (Al-Rashid, Al-Aqel, Al-Ghadir, Bin Shukiran, Khurshid, Al-Rashid et al., 2022). Also, although no research was found on the relationship between emotion regulation difficulty and thyroid gland disorder, but based on a close study, Virenga, Leto and Gion (2017) showed that there is a positive relationship between emotion regulation difficulty and chronic disease (such as thyroid gland disorder) And there is meaning. Pinner and Rutherford (2022) also showed in a research that there is a positive and significant relationship between emotion regulation and mental health in pregnant women.

Distress tolerance is also often defined as a person's perceived self-reported ability to experience and tolerate negative emotional states or behavioral ability to persist in goal-oriented behavior when experiencing emotional distress (Simmons and Gaher, 2005). Distress tolerance is also defined as the ability to tolerate annoying physiological states (Bernstein, Trafton, Ilgen, and Zollensky, 2008). Distress tolerance is an important variable in the initiation and continuation of psychological injuries as well as prevention and treatment (Zolensky, Bernstein and Vojanovic, 2011).

Although no study was found on the relationship between distress tolerance and thyroid gland disorder, but regarding a close variable such as resilience, a study showed that patients with thyroid gland disorder have lower resilience than healthy people (Zare et

al., 2019). Also, Jin, Zhou, Qin, Zhou, Sun, Wang and Shan (2021) showed in a research that the resilience score of women in the second pregnancy is relatively lower.

Qeshlaq et al.'s research (2016) also showed that the resilience score of people with chronic diseases (such as thyroid gland disorder) is significantly lower than healthy people.

Considering the importance of the mental health of pregnant women and their babies, it is more necessary to know important psychological mechanisms to prevent and intervene in psycho-physical and psychological problems. Women endure many hormonal changes during pregnancy, and thyroid gland disorders also have many psychological consequences. Therefore, their susceptibility to numerous psycho-physical and psychological problems increases during this period. Therefore, according to the existing research gap in this field, the upcoming research will be conducted with the aim of comparing psychological distress, emotional regulation difficulties and distress tolerance in pregnant women with and without thyroid gland disorders.

Method

The method of this research is a causal-comparative description. The statistical population was all pregnant women referred to Shariati Hospital and health centers in Bandar Abbas city. From this community, pregnant women with and without thyroid disorders (hypothyroidism and hyperthyroidism) were selected purposefully. The number of samples in each group was 50 participants. Based on Delaware (1400) in causal-comparative and experimental studies, groups with a sample size of 30 participants are appropriate. However, a higher sample number reduces the variance error and increases the generalizability of the results. Finally, 46 participants remained in each group after removing incomplete and outlier data. Also, the inclusion criteria included: being pregnant, having a thyroid gland disorder for group B, age between 25 and 45 years, and participants having a diploma or higher education. The exclusion criteria were having a serious psychiatric or medical illness and not completing the research instruments.

Materials

Kessler's Psychological Distress Scale (KPDS-10). Kessler's Psychological Distress Scale, which examines the patient's mental state during the last month, was designed by Kessler, Andreu, Kalp, Hiripi, Mrozek, Normand, et al. (2002). This scale has ten items. The answer to the questions is in the form of 5 options: all the time = 4, most of the time = 3, sometimes = 2, rarely = 1 and never = 0, which are scored between 0-4 and the maximum score is 40. Research conducted on Kessler's psychological distress scale shows a strong relationship between high scores in Kessler's psychological distress questionnaire and the diagnosis of mood and anxiety disorders by the Composite International Diagnostic Interview (CIDI). Also, there is a positive and significant relationship between scale scores and other mental illnesses (Vassiliadis, Chadzinski, Gotejo-Gara, & Perville, 2015). In addition, Kessler's psychological distress scale has a suitable sensitivity and characteristic for screening people with anxiety and depression (Kessler et al., 2002). Studies indicate the validity of this scale for screening studies and identifying mental disorders (Green & Karaki, 2010). Yaqoubi (2014) standardized this scale in a student sample in Iran. The

factor loading values for measuring the main factor were between 0.65 and 0.84. The Cronbach's alpha coefficient of the scale was 0.93 and the reliability coefficient of Split-half and Spearman-Brown was also 0.91.

Emotion Regulation Difficulties Scale (DERS-36). This scale was designed by Gratz and Roemer to assess difficulties in emotion regulation (Gratz & Roemer, 2004). This scale has 36 items and six subscales below. Non-acceptance of emotional responses (non-acceptance); difficulties in engaging in goal-directed behavior (goals); Impulse control difficulties (impulse); lack of emotional awareness (awareness); limited access to emotional regulation strategies (strategies); Lack of emotional clarity (transparency). Questions are scored on a five-point Likert scale from one (almost never) to five (almost always). Higher scores indicate greater difficulties in emotion regulation. The results related to the reliability of this scale showed that its internal consistency was 0.93 for the whole scale and between 0.80 and 0.89 for its subscales (Gratz & Roemer, 2004). In relation to the validity of this scale, the correlation of the overall scale and its subscales with the negative mood regulation scale has been significantly reported between -0.34 (for emotional awareness) and -0.69 (for the overall scale and emotion regulation strategies). (Gratz and Roemer, 2004). In another study, Cronbach's alpha was used to check the reliability of the scale, and the total coefficient of the questions was 0.96 and for the subscales in the range of 0.83 to 0.95 (Chazer et al., 2020). In Iran, the validity of the scale has been reported by test-retest correlation coefficients in the range of 0.57 to 0.80 and significant at the 0.01 level (Imani, Al-Khalil and Shokri, 2019). Also, another study in Iran has reported an internal consistency of 0.86 for the whole scale and for its subscales between 0.63 for awareness and 0.85 for transparency (Alavi, Modares Gharavi, Amin Yazdi, Salehi Faderdi, 2011).

Distress Tolerance Scale (DTS-15). The Distress Tolerance Scale is a self-report instrument developed by Simmons and Gaher in 2005. The questions of this scale evaluate distress tolerance based on the individual's ability to tolerate emotional distress, mental assessment of distress, the amount of attention to negative emotions when they occur, and regulatory measures to tolerate distress. This scale is answered individually. It includes 15 questions and four subscales of distress tolerance, being absorbed by negative emotions, mental evaluation of distress and adjustment of efforts in order to reduce distress. The items of this scale are scored based on a five-point Likert scale (totally agree: score 1 to totally disagree: score 5). The range of scores of this questionnaire is between 15 and 75. High scores in this scale indicate high distress tolerance. Alpha coefficients for these subscales are estimated as 0.72, 0.82, 0.78 and 0.70, and for all scales as 0.82. Shams, Azizi and Mirzaei (2010) also reported Cronbach's alpha value of this scale as 0.67 and its retest validity as 0.79. In the research of Shahidi, Amiri, Qamrani, Manshai and Kashanizadeh (2019), the alpha coefficients obtained for this scale were calculated as 0.81 and its reliability was reported using Cronbach's alpha coefficient as 0.80.

Findings

The demographic indicators of the research sample were examined, and the information related to the education and age of the participants was presented separately in Table 1.

Table 1. Demographic characteristics of the study sample

	Group	Index	Frequency	Percentage
Education	with thyroid gland disorder	Diploma and Bachelor's degree	31	60/7
		Graduate	20	39/3
	without thyroid gland disorder	Diploma and Bachelor's degree	34	66/6
		Graduate	17	33/4
		-	Mean	Standard deviation
Age	with thyroid gland disorder	-	35/17	2/49
	without thyroid gland disorder	-	33/98	2/31

According to Table 1, from the group of pregnant women with thyroid gland disorder, 31 people (60.7%) had diploma and bachelor's degrees, and 20 people (39.3%) had graduate education (master's degree and doctorate). Also, in the group without disorder, 34 people (66.6%) had diploma and bachelor's degrees, and 17 people (33.4%) had postgraduate education. The average age and standard deviation of the group with thyroid gland disorder were 35.17 and 2.49, and the age average and standard deviation of the group without thyroid gland disorder were 33.98 and 2.31. Next, the descriptive indices of the variables' mean and standard deviation were examined, presented in Table 2.

Table 2: Descriptive indexes of psychological distress, difficulty in emotional regulation and distress tolerance in groups of pregnant women with and without thyroid gland disorder

Index	Groups	Mean	Standard deviation
Psychological distress	with thyroid gland disorder	10/82	2/41
	without thyroid gland disorder	9/08	2/19
	with thyroid gland disorder	7/98	2/97
Difficulty in emotional regulation	without thyroid gland disorder	5/63	2/59
	with thyroid gland disorder	7/18	2/71

Distress tolerance	without thyroid gland disorder	8/57	3/49

Table 3: Results of multivariate analysis of variance (MANOVA) for psychological distress, difficulty in emotional regulation and distress tolerance

Index	Value	F	df	Error df	Sig
Wilks' Lambda	0/91	4/07	3	88	0/001

According to the information in Table 3, it can be seen that the value of F obtained in Wilks's lambda is 4.07, which is at a significance level of less than 0.01 ($p < 0.01$), so there is a significant difference in the average of the study variables. Next, an analysis of variance was performed, and inter-group effects were investigated, the results of which are presented in Table 4.

Table 4: Test results of the difference between groups in psychological distress, difficulty in emotional regulation and distress tolerance

Variable	Factor	Sum of squares	df	Mean square	F	Sig	Eta square
Psychological distress	with thyroid gland disorder	533/09	90	5/33	14/56	0/001	0/13
	without thyroid gland disorder	77/65	1	77/65			
Difficulty in emotional regulation	with thyroid gland disorder	778/90	90	7/78	18/12	0/001	0/15
	without thyroid gland disorder	141/17	1	141/17			
Distress tolerance	with thyroid gland disorder	49/42	90	49/42	5/04	0/027	0/05
	without thyroid gland disorder	979/92	1	9/79			

The results of Table 4 shows that between the average psychological distress ($p<0.01$, $F=14.56$) and difficulty in emotional regulation ($p<0.01$, $F=18.12$), distress tolerance ($p<0.05$, $F=5.04$) in pregnant women with and without thyroid gland disorder has a significant difference. The explanation is that psychological distress and difficulty in emotional regulation are significantly higher in pregnant women with thyroid gland disorder than those without thyroid gland disorder, and their distress tolerance is lower.

Discussion

The purpose of the present study was to compare psychological distress, emotional regulation difficulties, and distress tolerance in pregnant women with and without thyroid gland disorders. The results showed that pregnant women with thyroid disorders scored higher in psychological distress. However, no study was found on the relationship between psychological distress and thyroid gland disorders in pregnant women. However, the results of studies closely aligned with the results of this study are anxiety and stress in people with hypothyroidism (Amiri et al., 2015); The relationship between psychological distress and thyroid gland disorder (Lee et al., 2021); Psychiatric disorders, especially, major depressive disorder, suicide, generalized anxiety disorder, panic attacks and agoraphobia in people with hyperthyroidism (Shoeib et al., 2021); Anxiety and depression among patients with thyroid gland disorders (Gerkhali et al., 2020). Also, pregnant women with thyroid gland disorders scored higher in

emotion regulation difficulties. Although no study was found in this field, but the results of studies closely aligned with the results of this study are: Emotion regulation and mental health in pregnant women (Painer & Rutherford, 2022); Difficulty in emotion regulation in people with chronic illness (such as thyroid gland disorder) (Virenga et al., 2017).

Pregnant women with thyroid gland disorder also obtained lower scores in distress tolerance but no study was found in this field. However, the results of studies in the field of psychological resilience, which is a variable close to distress tolerance, are in line with the results of this study. (Zare et al., 2018; Gheshlagh et al., 2016; Jain et al., 2021).

Pregnancy brings hormonal changes that affect a person's psychological aspects. For example, stress, anxiety, and depression can be mentioned under these hormonal changes (Ma et al., 2019; Belido-Gonzalez et al., 2019). Also, the presence of a disorder in the thyroid gland leads to the creation, maintenance, and aggravation of many psychosomatic and psychological problems, including increased anxiety, palpitations, insomnia, and dementia (Son et al., 2009; Takshira et al., 2014; Chaker et al. et al., 2017; Chiovato et al., 2019). In the combination of these biochemical and psychophysical stressful conditions, difficulty in regulating emotions and bearing distress can also occur due to the weakening of physical and psychological dimensions, under the influence of pregnancy and thyroid gland disorders.

On the other hand, with the biochemical and psychological dimensions, behavioral manifestations of psychological distress, difficulty in regulating emotions and reducing the patient's distress tolerance in family and friendly relationships emerge. These manifestations can lead to mutual reactions and lead to worse conditions. For example, a mother's violent and aggressive behavior with her husband or children (under the influence of pregnancy and illness) can lead to an argument between them. It also leads to reciprocal violent behavior, which results in more anger and depression for the patient. Therefore, the vicious cycle of ineffective communication is created and strengthened, which can ultimately aggravate or maintain thyroid disorders and psychological problems. This study had limitations that include the average sample and only from one city. Therefore, it is suggested that further studies be conducted with a large sample in other cities to ensure the reliability of the results. It is also possible to compare pregnant women with thyroid gland disorder in different age and education groups. Based on the results, the following suggestions are made: public awareness (through the media and educational centers such as universities) and specialized (for pregnant women with thyroid gland disorders). As a result, in addition to preventing serious mental or physical damage to the mother, the baby can also be born healthy.

Ethics

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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