

An investigation on the frequency of thoughts, readiness and suicide attempt in individuals with thalassemia

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ABSTRACT

Background and Aim: Thalassemia major is one of the most common chronic genetic diseases in the world and in Iran that can impose many adverse effects on the self and society. Psychologically, patients with thalassemia are under stress. According to the World Health Organization (WHO), suicide is one of the leading causes of death worldwide. It is important to identify the people who have the highest risk factors for suicide. The present research investigates the frequency of thoughts, readiness and suicide attempts in people with thalassemia.

Methods: This was a cross-sectional study. Its sample was 150 patients with thalassemia in the age range of 10 to 46 years whom we selected through census by sampling at convenience. We gave to patients a standardized Beck Suicide Thought Assessment Questionnaire. We analyzed the research data using descriptive and inferential statistical tests.

Results: From among 150 patients with thalassemia in this study, 57.3% of the respondents were male and 42.7% were female. The results showed that there was a negative and significant relationship between suicide thoughts and attempts and age (-0.234) ($P < 0.05$). The mean prevalence of suicide in men (1.89) was significantly higher compared to women (0.79) ($P < 0.05$). We did not observe significant difference in prevalence of suicide thoughts and attempts between married and single groups with a mean difference (0.69) ($P < 0.05$) and, in different educational groups, no significant difference was reported ($P > 0.05$).

Conclusion: The findings of this research showed that among patients with thalassemia, the prevalence of suicidal ideation has a significant percentage. Since suicidal ideation provides a platform for preparation and attempt to commit suicide, so by providing mental health services and regular screening, we can take an effective step to prevent this problem among patients with thalassemia.

Keywords: Thalassemia, Suicidal ideation, Suicide.

INTRODUCTION

Thalassemia is one of the most common genetic disorders in the world, first diagnosed by Lee and Gypsy in 1952 (1). The term thalassemia (2) is derived from the Greek words Thalassa (sea) and heama (blood) (3). Because this situation was first observed in populations living in the Mediterranean (4, 5). Its characteristic is a decrease in the synthesis of one of the two types of polypeptide chains (α) or (β) that form normal adult hemoglobin (HbA, $\alpha_2\beta_2$) (6). Depending on the genes that affect globulin chain production, these Syndromes fall into α -thalassemia and beta-thalassemia. (6) People whose hemoglobin does not produce enough alpha protein have alpha thalassemia, while people whose hemoglobin does not produce enough beta protein have beta thalassemia. (3) There are also rarer forms, ie γ -, δ - and $\delta\beta$ -thalassemia (6). If the body does not produce enough of both proteins, red blood cells will not form properly and will not be able to carry proper oxygen. Its result is anemia (6) which requires special medical treatment and requires these patients (for survival) regular blood transfusions and iron transporters (chelators) (7, 8). It is a monogenic disorder inherited from parents to children as an autosomal recessive disorder (9, 10) and is a non-communicable disease (11, 12). Its symptoms occur in the age of 10 to 12 months (13, 14) (1, 15) and continues throughout life (3). Patients with thalassemia suffer from a variety of complications and symptoms, including severe and chronic anemia, stunted growth (16, 17), large spleen and liver, and bone disorders, especially visible changes in

head and facial bones with a change in gaze (11, 18). Pale, yellow skin, decreased growth of gonads, protruding forehead are other symptoms (19). Thalassemia major is one of the most common chronic genetic diseases in the world and in Iran (11). There are approximately 300 million thalassemia patients worldwide each year (20, 21). Geographically, thalassemia is a Mediterranean disease and occurs in countries (Italy, Cyprus, Greece, Sicily), the Middle East (Iran, Turkey and Syria) (22, 23), northern India and parts of Southeast Asia (24) and North Africa (25, 26). Although accurate statistics on the prevalence of beta thalassemia in Iran are not available, but according to estimates, its prevalence in Iran is about 4%, which is significantly higher than the global average prevalence of thalassemia (1.5%) (27, 28). Iran is among countries that are on the thalassemia belt in the world (20, 29) so that there are about 26,000 thalassemia patients (20, 30) and 2 to 3 million thalassemia carriers (1, 31). About 800 infants are born with thalassemia annually and added to this group (30, 32). The cities in which it is of the highest prevalence in Iran include marginal cities on the Caspian Sea, Persian Gulf, Mazandaran, Gilan, Khuzestan, Fars, Bushehr, Hormozgan, Sistan and Baluchestan and Kerman (11, 33). Thalassemia can have many adverse effects on the individual, family and society (34, 35). Psychologically, patients with thalassemia are under stress (16, 36). Eighty percent of patients with thalassemia major suffer from at least one mental disorder (37, 38). Patients with this chronic blood disorder may be in a state of anxiety,

depression, and aggression because social problems such as thinking about the future, limited social activity, and limited access to school are among the factors that predispose to these disorders (9, 39). According to studies, depression in thalassemia patients also increases the risk of substance abuse and suicide (1, 40). Suicide is a multi-causal and complex behavior that is caused by the interaction of various factors such as biological (41, 42), environmental and psychological ones (43, 44). Suicide and its attempt at the World Health Organization (WHO) session [1] in 1996, was declared as an important public health issue (45). It means harming oneself with the aim of destroying oneself (46, 47) as well as anger towards oneself (41, 48). The suicidal process falls into four main categories, which include thoughts, planning, action, and ultimately the completion of suicide (49). Suicidal ideation includes any thought of self-destruction (50). These thoughts contain a range of vague thoughts about the possibility of ending life to complete suicide (51, 52) but may never be fulfilled (53). In the planning stage of suicide, the person provides the appropriate conditions, tools or place for suicide. The attempt to commit suicide is a deliberate and conscious act, and is usually done to attract the attention of others. The purpose of this action is not to finish life (53). The fulfilled suicide, on the other hand, is, as defined by the World Health Organization, a conscious and deliberate attempt to kill oneself (43, 54). According to the statistics of World Health Organization (WHO), suicide is one of the leading causes of death worldwide (55). According to statistics released by the World Health Organization, it is estimated that every person commits suicide every 40 seconds (56). Between 800,000 and one million people die each year due to suicide (57) and twenty Millions attempt to commit suicide (58, 59) (60). The average prevalence of suicidal ideation, planning and fulfilling suicide in the world is 9.2, 3.1 and 2.7%, respectively (49, 61). In Iran, the suicide rate, although lower than in Western countries, is higher than in other Middle Eastern countries (57). The prevalence of suicide attempts in Iran under the influence of cultural and regional factors varies from 16.8% of a thousand people in the south of the country to 117.8% of a thousand people in the north of the country (53, 62). Due to the existence of the phenomenon of suicide and suicidal ideation in all human societies from the past years until today, there have been studies in this field, which we make mention of some of them. Carballo et al. (2011) (63) conducted a study and found that adolescents with major depressive disorder were at risk for suicidal behaviors. The present study also showed that all adolescents in both thalassemia and comparison groups fall into the group with a history of suicidal ideation and depression. Through a semi-structured interview (K-SADS), a study (64) examined the psychiatric diagnosis and suicide in children with thalassemia major. It predicted that suicidal ideation has a higher prevalence (28.8%) than suicide intention (5.1%) and suicide attempt (1.7%). Moreover, it stated that children with thalassemia major were likely to be at risk for the clinical forms of depression and suicide; so providing routine screening for mental health problems as well as suicidal ideation can lead to early detection and treatment. Another study from Iran (65) reported 43.6% suicidal

ideation, 27.3% suicidal intention and 7.3% suicide attempt in patients with thalassemia. However, the authors concluded that the suicide rate was similar to that of the general Iranian population, and that the diagnosis may not be associated with an increased risk of suicide. In another research, a relatively older group of Turkish patients with thalassemia (mean age: 17.42±4.65) reported in explanation a high level of suicidal ideation with a rate of 96.6% in patients and 98.4% in their caregivers (66). However, the literature on thalassemia and suicide is still very limited, and on the other hand, the results of the research background are not the same and do not have the necessary coherence. It is important to identify people who have the highest risk factors for suicide (41, 67). Early detection of suicidal ideation is also very important (49) because if we do not identify the person in whom suicidal ideation is formed and do not treated him, in the next stage he tries to plan for suicide (51). Therefore, it seems necessary to study the prevalence of suicidal ideation, and for this reason, we decided to study the prevalence of suicidal ideation in people with thalassemia.

METHOD

Research project and participants: The present study was descriptive cross-sectional. Its statistical population includes all thalassemia patients referred to Hazrat Ali Asghar (AS) Hospital in 2020. From among this statistical population, we selected 150 people through census by sampling at convenience. Criteria for inclusion were age range between 10 and 64 years, thalassemia, lack of comorbidity with other diseases. The criterion for exclusion was the patients' dissatisfaction and non-completion of the questionnaire.

Tool: Beck Questionnaire for Suicide Ideation: Beck and Steer (1991) prepared this questionnaire to reveal and measure the severity of attitudes and behaviors and to plan for committing suicide (68). This questionnaire is a nineteen-item self-assessment tool in which each scale is adjusted based on two point grades from 0 to 2. A person's total score is calculated based on the sum of scores (0-38). There are five screening questions in Beck Suicide Ideation Test. If the answers indicate an active or passive suicidal tendency, the subject should also answer the next fourteen questions. The average time to complete the questionnaire is 10 minutes. On this scale, a score of 0-5 indicates the absence of suicidal ideation, a score of 6-9 indicates suicidal ideation, and a score of 20-38 indicates intent to attempt suicide. Cronbach's alpha (internal consistency) and concurrent reliability of this scale were between 0.89, -0.96 and 0.83, respectively, and it is significantly associated with Beck Depression and Disappointment scales (68). This scale has been validated in Iran. Its reliability was 0.95 through Cronbach's alpha and its concurrent validity with the Depression Scale of the General Health Questionnaire was 0.76.

Procedure: After obtaining the necessary permits by referring to the research environment located in Hazrat Ali Asghar Hospital in Zahedan and providing a brief explanation about the purpose and process of this research, we provided the questionnaire to patients with thalassemia who expressed their satisfaction. They were also assured of the confidentiality of the information, and

that the collected data would not be provided to any other body. At the end of data collection, we analyzed them by SPSS software. To obtain the results in descriptive statistics, we used frequency, mean, standard deviation, as well as independent t-test and analysis of variance.

FINDINGS

Gender distribution of the respondents in this research indicates that 57.3% of the respondents were male and 42.7% were female. As for marital status, 72 respondents were single and 28% were married. As for education, 6.7% of respondents were illiterate, 47.3% under diploma, 41.3% with diploma, 2% with high school degree, 1.3% were of BSc degree and 1.3% of them had MSc degree and above. In terms of the prevalence of suicide ideation and attempts, 78.7% of the respondents stated that they have suicidal thoughts, 14% were ready to commit suicide and 7.3% intended to commit suicide. As for the age, average age of the respondents was 23 years, minimum age 10 and the maximum age was 64 years (Table 1).

Table 1: Frequency of respondents by demographic variables

Variables		Frequency	Percentage
Gender	Man	86	57.3
	Woman	64	42.7
Marital status	Single	108	72
	Married	42	28
Education	Illiterate	10	6.7
	Under diploma	71	47.3
	Diploma	62	41.3
	High school	3	2
	BSc	2	1.3
	MSc & above	2	1.3
prevalence of suicide thoughts and attempts	With suicidal thoughts	118	78.7
	Readiness to suicide	21	14
	Intention for suicide	11	7.3
Age	Mean age	23	
	Minimum age	10	Maximum age 46

According to Pearson correlation coefficient test, because the value of the significance level in the Pearson test table and the standardized covariance output is equal to 0.002 and 0.005, and this value is less than the critical level and the standard error of 0.05 with a confidence of 0.95, the above hypothesis is confirmable. The value of the correlation coefficient of these two variables is negative and equal to -0.23. It indicates that these two variables have a relatively good correlation intensity. Due to the slope of the regression line in the dispersion diagram, it shows a negative and inverse relationship between the two variable. We can infer that there is a significant negative relationship between age and the prevalence of suicide thoughts and attempt, so that as the age increases, the prevalence of suicidal thoughts and attempts will decrease and vice versa (Table 2).

According to the results obtained from t-test of independent samples, since the significance level of prevalence of suicidal thoughts and attempt with a

confidence of 0.95 is less than the error level of 0.05, we can infer that the average prevalence of suicidal thoughts and attempt is of a significant difference between the two groups of men and women. Thus, the above hypothesis is confirmable. According to the above test, men have a higher average in the prevalence of suicidal thoughts and attempts than women and have an average difference of 1.10 higher than women (Table 3).

Table 2: Pearson correlation coefficient test in line with assessing the correlation between age and prevalence of suicidal thoughts and attempt. "It seems that there is a relationship between age and prevalence of suicidal thoughts and attempt"

Pearson correlation coefficient test table			
Variable under study	Number	Pearson coefficient	Significance level
Age	150	-0.234	0.002
prevalence of suicidal thoughts and attempt	150		
Standardized covariance output table			
Relationship between emotional intelligence and entrepreneurship	Standard values	Critical points	Significance level
	0.23	2.77	0.005

Table 3: Independent samples t-test for evaluating and comparing the average prevalence of suicidal thoughts and attempt by gender variable

"It seems that the prevalence of suicidal thoughts and attempt is different between men and women."

Descriptive table of t-test for independent samples

	Gender	Mean	Standard deviation	Error of Standard deviation
prevalence of suicidal thoughts and attempt	Women	0.79	2.43	0.26
	Men	1.89	3.67	0.47

Inference table of t-test for independent samples

Variable under study	t-test	Significance level	Mean difference	Test result
prevalence of suicidal thoughts and attempt	2.17	0.04	1.10	Significant difference

According to the results obtained from t-test of independent samples, since the significant level of prevalence of suicidal thoughts and attempt with a confidence of 0.95 is less than the error level of 0.05, we can infer that the average prevalence of suicidal thoughts and attempt is not significantly different between the two groups of married and single people. Hence the rejection of the above hypothesis. According to the above test, married people have a higher average in the prevalence of suicidal thoughts and attempt than single people and have an average difference of 1.10 higher than single people. This difference is not a statistically significant difference (Table 4).

Table 4: Independent samples t-test for evaluating and comparing the average prevalence of suicidal thoughts and attempt by marital status variable

"It seems that the prevalence of suicidal thoughts and attempt is different between two groups of married and single people."

Descriptive table of t-test for independent samples

	Marriage	Mean	Standard deviation	Error of Standard deviation
prevalence of suicidal thoughts and attempt	Married	1.45	0.16	0.04
	Single	0.76	0.33	0.15
Inference table of t-test for independent samples				
Variable under study	t-test	Significance level	Mean difference	Test result
prevalence of suicidal thoughts and attempt	0.22	0.20	0.69	Significant difference

According to the above test, since the significance level in the one-way analysis of variance (ANOVA) test for the prevalence of suicidal thoughts and attempt with a confidence of 0.95 is greater than the standard error level of 0.05, we can infer that the mean prevalence of suicidal thoughts and attempt does not differ significantly according to different educational groups. Hence the rejection of the above hypothesis. Thus, the prevalence of suicidal thoughts and attempt does not differ between different educational groups. The highest to lowest acquired mean in the variable of prevalence of suicidal thoughts and attempt among different educational groups are 1. Higher school degree 2. Under diploma 3. Diploma 4. Illiterate 5. BSc degree 6. MSc degree and above (Table 5).

Table 5: One-way analysis of variance (ANOVA) test to evaluate and compare the average prevalence of suicidal thoughts and attempt according to different educational groups

"It seems that the prevalence of suicidal thoughts and attempt varies between different educational groups."

Variable	Mean	Standard deviation	F value	Significance level	Test result	
prevalence of suicidal thoughts and attempt	Illiterate	1.2	0.42	0.55	0.73	There is no significant difference in the prevalence of suicidal thoughts and attempt between different educational groups
	Under diploma	1.3	0.62			
	Diploma	1.2	0.57			
	High school	1.6	0.45			
	BSc	1	0.10			
	MSc & above	1	0.14			

DISCUSSION

Thalassemia major is one of the most common chronic genetic diseases in the world and in Iran (11). Thalassemia can have many adverse effects on the individual, family and society (34, 35). Psychologically, patients with thalassemia are under stress (16, 36). According to the World Health Organization (WHO), suicide is one of the leading causes of death worldwide (55). Identifying the

people who have the highest risk factors for suicide is very important (41, 67). Early detection of suicidal ideation is very important (49) because if the person in whom the suicidal ideation is formed is not identified and not treated, he then tries to plan for suicide (51). Therefore, the present research investigates the frequency of thoughts, readiness and attempt for suicide in people with thalassemia. The first finding of this research was that there is a significant negative relationship between age and the prevalence of suicidal thoughts and attempt, so that as age increases, the prevalence of suicidal thoughts and attempt will decrease and vice versa. Due to the lack of direct research in this field, this finding is indirectly consistent with the studies of Shirali and Kokbi (49), Nock MK et al. (69) and Örengül AC et al. (64). It is inconsistent with the result of Yengil E et al. (66). In their study of prevalence and factors of suicide, Shirali and Kokabi concluded that the mean score of suicidal ideation in youth and adolescents was significantly higher than that in middle-aged and elderly people (49). In another international study, the results showed that the prevalence of suicidal ideation was inversely associated with age, so that the highest frequency of suicidal ideation was in the age group of 18-34, and with increasing age, the frequency of suicidal ideation decreases (69). Another research predicted that suicidal ideation was more common than suicidal intention and attempt. It also stated that children with thalassemia major might be at risk for subclinical forms of depression and suicide (64). According to these findings, in the present study, we observed that with increasing age, the prevalence of suicidal intention and attempt in people with thalassemia decreases. In the study of Yengil E et al. (66), a relatively older group of Turkish patients with thalassemia reported high levels of suicidal ideation. The difference between the results of this study and our research can be due to the statistical population under study. Another finding of this research shows that the prevalence of suicidal intention and attempt is different between men and women. In this way, men have an average higher than that of women in terms of the prevalence of suicidal intention and attempt. Since no research has directly examined the prevalence of suicidal intention and attempt in patients with thalassemia, this finding is indirectly consistent with that of Heshmati et al. (46), Jan Bagheri and Bakhshi (70), Mousavi et al. (71). It is inconsistent with the results of Lee et al. (72), Sufi Afshar et al. (73), Shirali and Kokabi (49) and (74) Beautrais. According to the results of a research conducted by Heshmati et al., the prevalence of suicidal ideation was significantly higher in men than that in women (46). In two other studies conducted by Jan Bagheri, Bakhshi and Mousavi et al., suicidal ideation was more prevalent in men than women (70, 71). Although these researches have supported the higher prevalence of suicidal ideation in men than in women, we explain it by mentioning the role of men in making a living for themselves and their families. Men also are under a lot of psychological pressure, which can be one of the reasons for the increase in suicidal ideation in men; social, economic and cultural differences in this area are also relevant (71, 75). However, there is conflicting evidence; for example, in the study of Lee et al., the prevalence of suicidal ideation was higher in women than in men (72). In the study of Sufi Afshar et al., the prevalence

of suicidal ideation was higher in women than in men (73). In addition, in a research done by Shirali and Kokabi, suicidal ideation was significantly associated with female gender, so that suicidal ideation was higher in women (49). In another study, Beautrais reported that in Western societies, the frequency of suicidal ideation and suicide attempt in women was twice as high as in men (74). Explaining the different results of the researches, we can state that the conditions of individuals in different studies may not have been homogeneous and the population of the present study, which is patients with thalassemia, was different from the population of other researches. Other reasons include differences in methods, intent, confidence, acceptability of the culture of suicide, psychological pathology (including substance abuse, mood disorders, external behaviors, and tendency to violence) and psychosocial differences between men and women (74). Another finding of this study was that married people had a higher average in the prevalence of suicidal ideation than single individuals, but this difference was not statistically significant. Indirectly, the results of Shirali and Kokabi indicate that suicidal ideation is far more common in divorced, single, and widowed individuals than in married individuals (49). Also in the study of Mohammadi Nia et al. we saw a higher rate of suicidal ideation of single students compared to married people (76). In contrast, in the study of Janqorbani some single people had less suicidal thoughts than married people (70). In explaining the cause of these differences, we can consider it to be caused by the influence of social, economic and cultural conditions. The latest finding of this research was that the acquired mean of the prevalence of suicidal thoughts and attempt did not differ significantly with respect to different educational groups. This result is indirectly consistent with the study of Sufi Afshar et al. and Heshmati et al. (46, 73). It contradicts the results of the study of Mohammadi Nia et al. and Fan et al. (76, 77). The results of the two mentioned studies showed that the prevalence of suicidal ideation was not significantly different between different educational levels (46, 73). While in the results of Mohammadi Nia et al., suicidal ideation is more prevalent in BSc degree than in high school degree (76). In a study, Fan et al. concluded that the rate of suicidal ideation increases with the upward trend of the school years (77). The difference between the results of these studies and our study can be due to the heterogeneity of the conditions of the subjects under study such as age, socio-economic status, support of others and the population under study. Finally, the findings of the present study are important in terms of the fact that so far there has been little continuous and reliable research on the prevalence of suicidal thoughts and attempt in patients with thalassemia. Many people still suffer from this blood disease and the family members and first-degree relatives are affected by it in the long run.

CONCLUSION

The findings of this research showed that among the patients with thalassemia, the prevalence of suicidal ideation has a significant percentage. Since suicidal ideation provides a platform for preparation and attempt to commit suicide, therefore, by providing mental health services and regular screening, we can take an effective

step to prevent this problem among patients with thalassemia.

Limitations and Suggestions: One of the limitations of the present study is the small size of the research sample, which reduces its generalizability to all thalassemia patients. This is due to reduced literacy, inability to read and write, and unwillingness to participate in the research. Therefore, in future studies, we recommend a research with a larger sample size. The lack of a complete study of psychosocial indicators was another limitation of this study. Consequently, we suggest that in future researches, the researchers examine the impact of other variables such as social support and life expectancy and other demographic variables, including income levels. Finally, by the high incidence of thalassemia due to family marriages in Sistan and Baluchestan province, a similar research is necessary in the province.

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