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Research Article

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Anxiety and Depression among Children with Cancer, Children Undergoing Hemodialysis and Children with Thalassemia: A Comparative Study

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Abstract

Background: *Diagnosing a child with cancer has devastating physical, mental, and psychosocial consequences on the child's life as well as the whole family. It is estimated that two hundred thousand children and adolescents suffer from different types of cancer worldwide yearly, with the majority living in low and middle-income countries which translates to a high mortality rate in these countries.*

Objective: *This study aims to assess levels of depression and anxiety among children with different chronic conditions and make a comparison among them. In addition, the study will draw a comparison between children's perspective about their depression and parents' perspective. Furthermore, the study will address the associations between depression and anxiety with disease severity, duration and the presence of other co-morbidities.*

Methods: *This was a prospective, analytical, correlational study design in which Revised Children's Anxiety and Depression Scale (RCADS) was administered to assess depression and anxiety on 110 children; 50 children with cancer, 30 children with thalassemia and 30 children undergoing hemodialysis. Researchers interviewed children as well as their parents.*

Results: *Results showed that depression and anxiety were most prevalent in children with thalassemia. Interestingly, levels of depression and anxiety among children undergoing hemodialysis were higher than children with cancer. However, there were marked discrepancy between child's and parents' answers on scale questions. The levels of depression and anxiety, in all children, were statistically significant in relation with family size, income and parents' education.*

Conclusion: *We identified high prevalence rates of depression and anxiety among children included in this study. The findings support that the prevalence of depression and anxiety among children with chronic conditions should receive more attention in our local medical settings.*

Keywords: Depression, Anxiety, Child, Cancer, Hemodialysis, Thalassemia, Gaza.

Introduction

Depression and anxiety are the main mental health issues of children with chronic conditions such as cancer, end-stage renal disease (ESRD) and thalassemia. Depression and anxiety symptoms have gaining increasing attention [1]. Diagnosis with cancer can have a significant impact on mental health of any individual. However, this is more prevalent among vulnerable groups such as children. It doesn't only affect child's life, but also the whole family. Furthermore, not only cancer that changes child's life, but also other chronic conditions may have more devastating effect. Children undergoing hemodialysis could be exposed to depressive symptoms almost same as children with cancer do. In addition, children with thalassemia, who cannot have a normal daily activity due to the fear of any injury that may cause life-threatening bleeding, are even more susceptible to anxiety and stress. Depression is the most prevalent comorbid psychiatric disease among hemodialysis pediatric patients [2]. On the other hand, children with thalassemia suffer from stress and anxiety due to several factors such as changes in physical appearance, stigmatization, and depression [3].

Cancer is the second leading cause of death globally and is estimated to account for 9.6 million death in 2018 [4]. Among children in Gaza Strip, 6.6% of deaths are due to cancer. While renal failure caused 1.3% of deaths in 2017 [5]. Thalassemia affects approximately 4.4 of every 10,000 live births throughout

the world [6]. In Palestine, 4% of the population are known to be thalassemia carriers with new cases continuing to appear despite the availability of prenatal testing [7].

A recent study showed that 11-62% of thalassemic patients developed depression, most were children, which is associated with high morbidity and mortality. Understanding the extent of the problem related to depression and its contributing factors is important for early management. It was reported that depression among children undergoing hemodialysis is directly related to duration of dialysis [8, 9].

The lack of research investigating the well-being and psychological aspect among children with cancer, thalassemia and children undergoing hemodialysis encouraged this research. This study aims to explore levels of depression and its associations with disease severity, duration and the presence of other co-morbidities. Furthermore, the study will draw a comparison between child's perspective and parents' perspective on levels of depression and anxiety among children.

Methods

Research Design

The design of this study is descriptive, correlational, analytical and cross-sectional design. As the study aims to determine the depression and anxiety levels among study population, this is the most appropriate design.

Setting of the study

The study took place at two hospitals in Gaza Strip. These hospitals were Elrantessy Specialized Pediatric Hospital in Gaza city, which is the main center for pediatric cancer patients, and European Gaza Hospital.

Study sample

The study included children between 7-12 years of age and their parents. The sample was as follows: 50 children with cancer, 30 children with thalassemia and 30 children undergoing hemodialysis at two hospitals in Gaza Strip. Researchers interviewed children as well as their parents. All interviewed parents were mothers. The sample was chosen according to the inclusion criteria in the next paragraph.

Eligibility criteria

The following criteria must be met in the child in order to be included in study sample.

- Age 7-12 years.
- The child is diagnosed with cancer or other chronic conditions, namely: renal, or thalassemia.
- The child doesn't suffer from any documented mental illness.
- The child is able to respond to study questions.
- Child's parents must attend the interview.

Data collection

Initially, a team composed of 10 medical students was trained on study protocol and interview questions. After getting the permission, face to face interviews with children and their parents were conducted in the above-mentioned hospitals. An informed consent was gained from parents.

Operational definitions

Children in this study are individuals aged between 7-13 years as mentioned the eligibility criteria. We defined depression as the child suffer from depressive symptoms not a child diagnosed with depressive disorder. The symptoms included (1) feelings of sadness, tearfulness, emptiness or hopelessness, (2) angry outbursts, irritability or frustration, even over small matters, (3) loss of interest or pleasure in most or all normal activities especially playing with other children, (4) Sleep disturbances, (5) tiredness and lack of energy, so even small tasks take extra effort, (6) reduced appetite, (7) feelings of worthlessness as the child has a chronic disease, (8) trouble thinking and concentrating especially at school and (9) frequent or recurrent thoughts of death observed by parents. On the other hand, we used the definition of anxiety as emotion characterized by continuous worried thoughts that disturb any child's normal daily activity.

Instruments

The psychometric tools included in the study are presented below.

1) A semi-structured questionnaire concerning demographic data (age, gender, gestational age, birth weight, disease history, education, etc.…).

2) Revised Children's Anxiety and Depression Scale (RCADS). The Revised Children's Anxiety and Depression Scale (RCADS) and the RCADS - Parent Version (RCADS-P) are 47-item questionnaires that measure the reported frequency of various symptoms of anxiety and low mood. They produce a total anxiety and low mood score and separate scores for each of the follow subscales: separation anxiety; social phobia; generalized anxiety; panic; obsessive compulsive; total anxiety; and, low mood. The English version is validated and has a Cronbach's alpha ranged from 0.75 to 0.95 which indicates a good internal consistency [10].

Statistical Analysis

Data obtained were coded and entered into SPSS. Categorical variables were presented as frequency and percentage while continuous variables were presented as mean and standard deviation. Spearman correlation test was used to test for relationship with continuous variables while Independent sample T-test was used to determines whether there is a statistically significant difference between the means in study groups.

Permission and ethical considerations

An approved permission was gained from Ministry of Health in Gaza Strip to conduct interviews with pediatric patients and their parents. Furthermore, informed consents were also gained from parents and any unclear questions will be simplified for the participant.

Results

Baseline characteristics of children and their parents

Study participants were classified into three groups: children with cancer, children with thalassemia and children undergoing hemodialysis. Mean age among children was 9 + 2.5 years and

all of them were in the age group 7-13 years. Among all children, 64 (58%) were males and most of children attend school (n= 101, 92%). More details on sociodemographic data of study sample are provided in table 1.

Type of cancer varied among children. The most prevalent type was leukemia followed by neuroblastoma and then renal tumor.

Table 1: characteristics of study participants

Study variables		Children with cancer (n= 50)	Children with thalassemia (n= 30)	Children undergoing hemodialysis (n= 30)
Gender	Male	31	16	18
	female	19	14	12
Child education	Yes	47	30	27
	No	3	4	3
Child hospitalization in days per week (Mean (standard deviation))		4 (2)	2	4 (3)
Diagnosis duration (Mean (standard deviation))		3 (2)	9 (4)	4 (3)
Family size (Mean (standard deviation))		7 (2)	5 (2)	9 (2)
(Mean (standard deviation)) Parent's age		36 (7)	38 (4)	36 (6)
Parent level of education	No school	5	9	0
	Secondary	21	14	18
	University	4	7	12
Parent employment	Yes	22	13	21
	No	28	17	9
Family income	Low	32	14	19
	Intermediate	15	14	4
	High	3	2	7

Levels of depression and anxiety among children

Depressive and anxiety symptoms were most prevalent among children with thalassemia followed by children undergoing hemodialysis and lastly children with cancer. The percentages were as follows: 86.6% (n= 26) of children with thalassemia suffered from these symptoms. Those children suffered mostly from being unable to play with their colleagues and they felt sad most of the time. Children undergoing hemodialysis suffered more from sleeping disturbance, reduced appetite and lack of energy. Depressive and anxiety symptoms were evident among 80% of them (n= 24). Children with cancer experienced less symptoms than children in the other two groups as two thirds of them (n=20) had depressive symptoms. These symptoms were poor appetite, loss of weight, loss of interest and death thoughts. These numbers were what children reported. On the other hand, parents had higher perspectives on depression and anxiety among children with cancer and lower perspective among children with thalassemia and children undergoing hemodialysis. Figure 1 shows how child's perspective differed from parents' perspective.

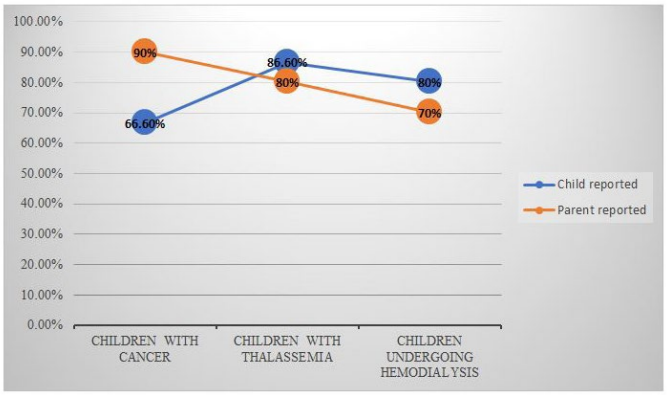

Figure 1: Percentages of child reported levels of depression and anxiety compared to parents reported.

Statistical Relationships between sample characteristics and levels of depression and anxiety

We found some statistical relationships between study independent variables and levels of depression and anxiety among children. Some variables are thought to be a cause for presence of depressive and anxiety symptoms among children. For instance, levels of depression and anxiety were higher in children who are hospitalized more frequently. And it was noticed that as days of hospitalization increase per week, depressive symptoms are more evident. On the other hand, child's nor parents' education seemed to affect child's life. However, good levels of parents' education helped them for better understanding of their children's health status. Another important variable that affected

children is duration of diagnosis. It was observed that children with longer duration suffered more than children who were diagnosed newly. In addition, family economic status had an impact on child's mental health. Children of families with low income were more anxious than children of families with high income. Nevertheless, family size has a positive effect on child's status as the child has better support from his or her siblings.

Reliability statistics

Internal consistency, measured by Cronbach's alpha, for RCADS was already calculated in the literature (0.75 to 0.95) [10]. In our study, we translated the scale to Arabic language to suit our setting. And to the best of our knowledge, we are the first to translate it to Arabic. Our Arabic version had a Cronbach's alpha value of 0.952 which indicates a good internal consistency.

Discussion

Assessment of mental health of patients with chronic conditions is very essential since they are prone to many psychosocial health problems. Children are a vulnerable group and significantly affected by their chronic conditions. The impact of their mental health affects nor only the child, but the whole family. Our study included three groups of children with different chronic conditions. Initially, it was thought that children with cancer would be most affected by their disease, but after the completion of the study, it was found that thalassemic children are the most affected. Authors think that this could be explained as follow. Children with thalassemia had their siblings may also have the same disease, which may be a contributory factor the presence of anxiety and depression among them. On the other hand, children with cancer are sometimes offered treatment outside Gaza Strip. This, in turn, may reduce depressive symptoms among them. Results showed that parents overestimate the level of depression and anxiety among their children. It was clear that child's perspective is less than parents' in all groups. However, parents were very supportive to their children.

High percentages of depressive symptoms among children included in this study could not be only attributed to disease related factors. Family economic situation was a strong factor to affect child's mental health. Furthermore, the general status in Gaza Strip may also contribute to the high levels of depressive and anxiety symptoms. A study conducted on 58 oncology pediatric patients in Jordan revealed that 20.68% of them had depressive symptoms according to Child Depression Inventory (CDI), child reported. This percentage is too low compared to our study in which 66.6% of 50 children with cancer had depressive symptoms. In the same study, children with cancer were compared to other children with chronic conditions (diabetes, renal failure, cystic fibrosis, juvenile rheumatoid disorders, thalassemia). In contrast to our study, it was found that children in the group of chronic conditions had a slightly lower level of depression than children with cancer (17.85%, n= 10) [11].

Most studies in the literature focused on children with cancer, however, there were some literature about children with thalassemia [8]. The prevalence of depression was 34.4% of 64 children with thalassemia in It was identified that low maternal education is an associated factor among these children.

Multivariate regression analysis

Multivariate analysis revealed that hospitalization, diagnosis duration and family income were independent factors positively associated with depression and anxiety in children in all groups of study sample.

Children undergoing hemodialysis were not a frequent target group for researchers. A study conducted in Peru on 67 patients, with mean age of 14.67 + 2.71 undergoing chronic dialysis showed that 10.45% (n= 7) suffered from high occurrence of depressive symptoms. on the other hand, 43.28% (n= 29) experienced low occurrence of depressive symptoms and the rest didn't suffer at all. It is evident that these percentages are also too low comparing to our children. It is obvious that Gaza Strip economic status is a contributory factor to depression in our study sample. Another study conducted in Egypt, which may have similar social conditions as in Gaza Strip, demonstrated that anxiety and depression are highly prevalent in children on regular hemodialysis than normal children as compared in the study. It was found that 95% and 65% of 40 children included in the study suffered from severe depression and anxiety respectively [12, 13].

Mental health among children with chronic conditions in Gaza Strip is not well-assessed. And to the best of our knowledge, this is the first study to spot light on one the most important mental health problems among children in Gaza Strip. However, researchers had assessed quality of life among children with cancer [14]. Salah M and his colleagues found that most of the participants had a medium level of quality of life with the mean score was 52.53% using Pediatric Quality of Life Inventory (PedsQL 4.0 generic core scale). They recommended to raise awareness among health care professionals on the importance of communication skills.

Conclusion

High prevalence rates of depression and anxiety occurred among children included in this study especially thalassemic children. This study showed also that oncology pediatric are not the most affected group by their condition. The findings support that the prevalence of depression and anxiety among children with chronic conditions should receive more attention in our local medical settings. Furthermore, we recommend the initiation of qualitative research with this group as they need more space to talk and express their feelings more and more.

Limitation

The cross-sectional study design limited our ability to uncover causal relationships between depression and other factors. Another limitation of this study was that we did not include all other psychosocial stressors and we did not investigate potential biological factors (e.g., hormone levels, etc.) in this study. Furthermore, during the conduction of the study the following

difficulties emerged:
1) Interference of external factors such as noise, fatigue of the patients, interruptions by the personnel as the study took place in hospital environment.
2) Study population, children and their parents, sometimes complained from the length of the questionnaire.

Competing Interest
Authors declare that they have no competing interests.

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Availability Of Data And Materials
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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