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Case Report / Olgu Sunumu

Nursing Care of a Patient Diagnosed with Thalassemia Major According to Gordon's Functional Health Patterns Model: A Case Report

Gordon'un Fonksiyonel Sağlık Örüntüleri Modeline Göre Talasemi Majör Tanısı Konan Bir Hastanın Hemşirelik Bakımı: Bir Vaka Sunumu

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ABSTRACT

Introduction: Thalassemia is a subtype of Mediterranean anemia, a genetic disease, and is caused by genetic defects during the synthesis of the hemoglobin molecule. It is closely associated with errors in the α and β globin synthesis genes. This genetic disorder can cause various problems in basic health areas.
Case Report: B.A., a 15-year-old girl, was diagnosed with thalassemia and type 1 diabetes, resulting in frequent hospitalizations due to fatigue, infections, and blood sugar management issues. She also faced stress, emotional instability, and a decline in her quality of life. A comprehensive assessment using Gordon's Functional Health Patterns Model identified nursing diagnoses by NANDA-I (North American Nursing Diagnosis Association - International). B.A.'s family, with limited knowledge about her conditions, actively participated in educational programs. Interventions included stress management, patient education, family training, psychosocial support, and physical rehabilitation.
Conclusion: Results of these interventions lead to improvements in B.A.'s stress, self-esteem, sleep, attention, and physical activity. This case highlights the effectiveness of Gordon's Model in managing thalassemia and diabetes, positively impacting B.A.'s quality of life. It is recommended that future qualitative and quantitative studies or case presentations, be conducted with larger sample sizes.
Keywords: Functional health patterns, Nursing care, Thalassemia, NANDA-I

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ÖZET

Giriş: Talasemi, Akdeniz anemisinin bir alt tipi olan genetik bir hastalıktır ve hemoglobin molekülünün sentezi sırasında oluşan genetik kusurlardan kaynaklanır. α ve β globin sentez genlerindeki hatalarla yakından ilişkilidir. Bu genetik bozukluk temel sağlık alanlarında çeşitli sorunlara neden olabilir.
Olgu Sunumu: 15 yaşında bir kız olan B.A.'ya talasemi ve tip 1 diyabet teşhisi kondu ve bu da yorgunluk, enfeksiyonlar ve kan şekeri yönetimi sorunları nedeniyle sık sık hastaneye yatmasına neden oldu. Ayrıca stres, duygusal dengesizlik ve yaşam kalitesinde düşüş yaşadı. Gordon'un Fonksiyonel Sağlık Modelleri Modeli kullanılarak yapılan kapsamlı bir değerlendirme, NANDA-I (Kuzey Amerika Hemşirelik Tanı Derneği-Uluslararası) tarafından konulan hemşirelik tanılarını belirledi. B.A.'nın ailesi, onun durumu hakkında sınırlı bilgiye sahip olmalarına rağmen, eğitim programlarına aktif olarak katıldı. Müdahaleler arasında stres yönetimi, hasta eğitimi, aile eğitimi, psikososyal destek ve fiziksel rehabilitasyon yer aldı.
Sonuç: Bu müdahalelerin sonuçları B.A.'nın stresinde, öz saygısında, uykusunda, dikkatinde ve fiziksel aktivitesinde iyileşmelere yol açmıştır. Bu vaka, Gordon Modeli'nin talasemi ve diyabetin yönetimindeki etkinliğini vurgulayarak B.A.'nın yaşam kalitesini olumlu yönde etkilemektedir. Gelecekte yapılacak nitel ve nicel araştırmaların veya vaka sunumlarının daha geniş örneklem büyüklükleriyle yapılması önerilmektedir.

Anahtar Kelimeler: Fonksiyonel sağlık örüntüleri, Hemşirelik bakımı, Talasemi, NANDA-I

1. Introduction

Thalassemia is a Mediterranean anemia disease known as a hereditary hemoglobinopathy that develops due to hemoglobin synthesis defects and is the most frequently genetically transmitted disease in the world. These defects are divided into two main groups according to the problems that occur in the synthesis of α and β chains: α thalassemia and β thalassemia. α thalassemia occurs due to problems in α chain synthesis and this may result in decreased α chain production (α +) or no production (α 0). β thalassemia develops due to problems in β chain synthesis and this is characterized by decreased β chain production (β +) or no production (β 0) (Atagün and Altuntaş, 2022; Ertuğrul, 2009). Studies show that consanguineous marriages increase the risk of beta thalassemia (Konca et al., 2013; Kazgan and Küpeli, 2017). According to the 2022 research of the Turkish Statistical Institute, the province with the highest rate of individuals aged 16 and over who had a consanguineous marriage in their last marriage was determined as Mardin (Turkish Statistical Institute [TUIK], 2022). Based on this research, it has been observed in studies that thalassemia cases may be higher than expected in regions where consanguineous marriages are common, such as Mardin, due to reasons such as frequent consanguineous marriages and high birth rates (Kazgan and Küpeli, 2017). It has been determined that theories contribute to the knowledge content of nurses in thalassemia cases and bring more practical approaches to the care provided (Altundağ, 2016). In addition, as a result of the examinations, it has been observed in studies that the quality of life is good in children and adolescents who receive the support of healthcare personnel (Ceylan et al., 2018). Therefore, it is very important for healthcare professionals to determine an effective care model and present it to the patient in order to provide effective care services to thalassemia patients (Altundağ, 2016). Thalassemia is one of the chronic diseases that negatively affects the physical and mental well-being of the individual. For this reason, psychological and social problems can be observed in children and parents due to the lethality of the disease, some difficulties related to treatment, and secondary disorders caused by iron accumulation (Sürer Adanır et al., 2017; Karaaziz and Okyayuz, 2020). Since the eleven health functions in the Functional Health Patterns Model discussed by Gordon include the patient's psychological functions along with their physical functions, it is important to consider patients diagnosed with thalassemia with a holistic approach, considering that it can increase the quality of life of patients in terms of nursing care (Altundağ, 2016; Ceylan et al., 2018). In this case report, a 15-year-old patient with congenital beta thalassemia was examined, and the effect of nursing care on the patient's quality of life was assessed using Gordon's Functional Health Patterns Model. Based on the results of these assessments, customized nursing diagnoses (by NANDA-I) were created based on the factors in each function.

2. Case Report

B.A. is a 15-year-old girl. B.A., the youngest in a family of six children, was admitted to Midyat State Hospital by her family due to complaints of whiteness on her face since birth, and as a result of the examinations, she was diagnosed with thalassemia resulting from defects in the β chain. The family referred B.A. to Malatya İnönü University Faculty of Medicine for more effective treatment, but continuous treatment procedures are carried out at Midyat State Hospital. B.A.'s physical characteristics are indicated by her weight of 52 kilograms and height of 155 cm. Her family earns their living by farming, and their socioeconomic level is not good enough. Her mother is illiterate, while her father is a secondary school graduate. The family covers her treatment expenses with social security provided by the state as health insurance. B.A. was diagnosed with Type 1 Diabetes three years ago and has been receiving insulin and medication treatment since then. She also underwent a splenectomy and her symptoms decreased after this operation. There is a family history of thalassemia; her brother had a successful bone marrow transplant. B.A. and her family, who only use medications due to lack of knowledge about diabetes, are not informed about this issue. However, they expressed that they are pleased with the success achieved and support provided during the treatment process. B.A. has been interested in drawing since childhood. This talent brought her first place in the insulin-related painting competition held in Malatya and she also showed success in other painting competitions held in Mardin. Her family stated that they provided great support to B.A. during her treatment process. The family actively participated in educational programs and gained information about the management of her chronic diseases. Laboratory results are as follows: B.A.'s laboratory tests revealed that her hemoglobin level was 7.2 g/dL (below normal) in the complete blood count, and her hematocrit level was 22.5% (below normal). Her erythrocyte count was 3.0 million/mm³ (low), and her mean corpuscular volume (MCV) was 60 fL (low), which indicates microcytic anemia. Hemoglobin electrophoresis showed that HbA levels were 12% (low), HbF was 80% (high), and HbA2 was 6% (high). A glucose test indicated that her fasting blood

glucose level was 180 mg/dL (high), and her HbA1c value was 9.2% (high), indicating poor diabetes control. B.A.'s serum ferritin level was 1000 ng/mL (high), and her serum iron level was 320 µg/dL (high), which suggests iron accumulation due to thalassemia. Reticulocyte count was 7.5% (higher than normal), indicating that her body is attempting to increase red blood cell production. Additionally, her insulin level was 4 µU/mL (low), and her C-peptide level was 0.7 ng/mL (low), reflecting endogenous insulin production in Type 1 diabetes. B.A.'s kidney and liver function tests were within normal range, but lipid profile tests showed a triglyceride level of 300 mg/dL (high), which reflects the long-term effects of diabetes. The drugs used by our case are as follows;

Table 1. Drug Table

Drug Name	Route of Delivery	Frequency of Issuance
Fuarte 125 mg	Oral	Once a month
Lantus Solostar 100 U/mL	Subcutan	Once daily for 18 days (1*18)
Humalog Kwikpen 200 U/mL	Subcutan	Three times daily for 10 days (3*10)
ES	Intravenous	Once a month

mg= Milligram, U/mL= Units per milliliter, ES=Erythrocyte Suspension

2.1. Evaluation of the Child According to Marjory Gordon's Model of Functional Health Patterns

Gordon's Functional Health Patterns Model is a nursing perspective that he developed in 1987 by associating the health and life process with certain behaviors. This model, called 'Functional Health Patterns (FHP),' offers an approach that aims to collect and organize information. It emphasizes critical thinking and clinical decision-making skills in the nursing process. By classifying it under 11 main headings, Gordon has presented FHP as a comprehensive model that includes health perception, management, nutrition-metabolic status, excretion, activity-exercise, cognitive-perceptual, sleep-rest, self-perception, role-relationship, sexuality-reproduction, coping-stress tolerance, and value-belief patterns (Kazgan and Küpeli, 2017).

During the assessments conducted using this model, NANDA-I (North American Nursing Diagnosis Association- International) nursing diagnoses were made for the patient, and these diagnoses were determined based on the latest NANDA-I classification for 2024-2026. The diagnoses were thoroughly analyzed in relation to the patient's health condition and needs, forming the foundation for appropriate planning and interventions. In this way, the integration of the NANDA-I classification into the health assessment process facilitated the development of an effective approach tailored to the patient's specific needs (Herdman et al., 2024).

2.1.1. Health perception - health management

B.A. continues her education at an open high school, struggling with the diagnosis of thalassemia. In the process of coping with symptoms such as fainting, fatigue, shortness of breath, pale skin, and weakness, the fact that this condition restricts her daily life and activities is among the main factors in her life. After the thalassemia treatment and splenectomy operation, B.A. has developed a positive perception of her health. However, although she is aware that she is struggling with a chronic disease, she takes the necessary precautions to protect her health. And sometimes due to the effects of the disease, she feels inadequate in terms of perception and management. So, it is recommended that the process of health perception and management be advanced with the supervision of a specialist.

Nursing diagnosis 1: Inadequate health self-efficacy

Domain 6: Self-perception

Class 2: Self-esteem

Descriptive features: B.A. experiences difficulty coping with symptoms such as fainting, fatigue, shortness of breath, pale skin, and weakness, all of which significantly impact her daily life and activities. B.A. is currently enrolled in an open education high school, where she continues to struggle with the diagnosis of chronic thalassemia. Despite the positive improvement in her perception of health status after treatment and surgery, B.A. occasionally feels inadequate and faces difficulties in managing her condition. Laboratory findings also reflect the ongoing challenges B.A. faces in managing her health. Her hemoglobin level of 7.2 g/dL (low) and hematocrit of 22.5% (low) indicate microcytic anemia, which contributes to her fatigue and weakness. Additionally, her elevated serum ferritin (1000 ng/mL) and iron levels (320 µg/dL) highlight iron overload due to thalassemia, further complicating her condition.

Objective: To reduce B.A.'s difficulties in health perception skills. To increase B.A.'s level of accurate knowledge about health status and treatment plan. To reduce B.A.'s restrictions in daily life activities.

Initiatives:

- One-on-one interviews were conducted with B.A. to gather detailed information about the causes and effects of her health perception difficulties, focusing on her experience with chronic disease management.
- B.A. and her family members were educated about thalassemia, its treatment, and the importance of monitoring lab results (e.g., regular assessments of hemoglobin, ferritin, and glucose levels) to better understand her health status and manage her condition effectively.
- Together with B.A., appropriate strategies were developed to enable her to continue her daily activities, taking into account her lab results and symptoms. For instance, energy conservation techniques and a modified physical activity plan were implemented, considering her anemia and fatigue.
- In collaboration with the healthcare team, an individualized plan was developed to optimize B.A.'s thalassemia management, including addressing the challenges posed by iron overload and improving her glucose control to prevent complications. Special attention was given to her nutrition, given the high serum ferritin and the potential for diabetes-related complications, with a focus on balanced iron intake and monitoring her HbA1c (which was 9.2%, indicating poor diabetes control).

Evaluation: B.A. has started to perceive her health status more effectively, with a noticeable improvement in her ability to carry out daily activities. The education provided to B.A. and her family has led to increased confidence and a better understanding of thalassemia management. This has resulted in a reduction of restrictions in B.A.'s daily life, including improved physical activity levels, better energy management, and more accurate health self-perception. Additionally, her family members have become more conscious and proactive in supporting her health management, particularly in making informed decisions related to her nutritional intake and the management of thalassemia-related symptoms.

Following interventions, there was a slight improvement in B.A.'s laboratory values, including a reduction in the reticulocyte count, which was previously elevated (7.5%), indicating better management of anemia through treatment and lifestyle modifications.

2.1.2. Nutrition and metabolism

B.A. has nutritional deficiencies due to thalassemia and type 1 diabetes. Her laboratory results indicate a serum ferritin level of 1000 ng/mL and a serum iron level of 320 µg/dL, suggesting iron accumulation due to thalassemia. Despite this, she has difficulty in meeting her increased iron requirements. Her hemoglobin level is 7.2 g/dL, which is low, indicating anemia. Additionally, her MCV is 60 fL, reflecting microcytic anemia, and her reticulocyte count is elevated at 7.5%, showing her body is attempting to increase red blood cell production. To address these issues, B.A. needs to be meticulous about her diet along with regular iron therapy.

Furthermore, her fasting blood glucose is 180 mg/dL and HbA1c is 9.2%, indicating poor control of her diabetes. Her insulin level is low at 4 µU/mL, and her C-peptide level is also low at 0.7 ng/mL, suggesting a need for careful management of her type 1 diabetes. However, her family is not sufficiently informed about the diabetes diet, and this lack of knowledge may lead to difficulties in effectively managing her diabetes. Therefore, both B.A. and her family need to receive professional support to improve their understanding of nutrition and manage her conditions effectively.

Nursing diagnosis 2: Inadequate nutritional intake

Domain 2: Nutrition

Class 1: Ingestion

Descriptive features: B.A. has nutritional deficiency due to thalassemia and type 1 diabetes. She has difficulty in meeting increased iron requirements. She requires the necessity for regular iron treatment and the need to approach the diet meticulously along with this treatment.

Objective: To meet B.A.'s iron and other nutritional needs more effectively. To align her diet with treatments for thalassemia and type 1 diabetes.

Initiatives:

- One-on-one interviews were conducted with B.A. to gather information on her eating habits, taking into consideration her high serum ferritin levels (1000 ng/mL) and elevated serum iron (320 µg/dL), which indicate iron accumulation due to thalassemia. This data informed the dietary recommendations to manage iron levels.

- B.A. was regularly trained on iron therapy and a nutrition plan, with a focus on balancing her iron intake due to her thalassemia and diabetes management. Her HbA1c level of 9.2%, indicating poor diabetes control, also influenced the dietary adjustments, ensuring that she had a plan that supported both her iron therapy and blood sugar control.
- B.A.'s family was provided with one-on-one training to support her eating habits and diabetes treatment process, helping them understand the relationship between B.A.'s increased iron levels, diabetes management, and the importance of maintaining a balanced diet. This training also took into account her elevated fasting blood glucose levels (180 mg/dL), to help the family better support her nutritional needs in the context of thalassemia and diabetes.

Evaluation: B.A. began to take more conscious and practical steps regarding healthy eating, and at the same time, her previously elevated serum ferritin level decreased from 1000 ng/mL to 600 ng/mL, leading to a positive improvement in her overall health status.

Nursing diagnosis 3: Ineffective adolescent eating dynamics

Domain 2: Nutrition

Class 1: Ingestion

Descriptive features: B.A.'s family did not have enough knowledge about the diabetes diet, and this caused difficulties in effectively managing the diabetes process.

Objective: To increase the family's knowledge about diabetes diet. To improve the level of family support in diabetes treatment and management.

Initiatives:

- One-on-one interviews were held with B.A.'s family about the diabetes diet.
- Family members were trained on the basic principles and implementation of the diabetes diet.
- Appropriate strategies were developed with B.A.'s family regarding diabetes treatment and nutrition.

Evaluation: An increase in the family's knowledge about diabetes was observed, and family members began to provide more conscious support during B.A.'s diabetes treatment process.

2.1.3. Excretion

A healthy excretory system observed in B.A. shows that she performs her daily urination and defecation functions regularly and healthily.

2.1.4. Activity and exercise

The limitation in physical activity level experienced due to thalassemia is directly related to the symptoms of fatigue and weakness that B.A. experiences in daily life activities. Regular exercise is an important factor that can positively affect both B.A.'s physical and mental health. However, it is essential that this exercise program is carefully organized in accordance with B.A.'s current physical condition.

Nursing diagnosis 4: Impaired physical mobility

Domain 4: Activity/rest

Class 2: Activity-Exercise

Descriptive features: The limitation in the level of physical activity experienced due to thalassemia. The symptoms of fatigue and weakness encountered in daily living activities.

Objective: To increase B.A.'s physical activity level. To reduce restrictions on daily living activities. To improve overall quality of life by reducing symptoms of fatigue and weakness.

Initiatives:

- One-on-one interviews were conducted with B.A. to understand the reasons for the restrictions in daily life activities, especially considering her low hemoglobin level (7.2 g/dL) and microcytic anemia indicated by her low MCV (60 fL). These factors may contribute to fatigue and limited physical capacity, which was explored during the interviews.
- B.A. was given training on the relationship between thalassemia and physical activity. The importance of a regular exercise program was emphasized, particularly as physical activity can improve overall health and help manage symptoms of anemia. However, the plan was tailored to her condition, taking into account the need for careful management due to her low reticulocyte count (7.5%) and the potential for excessive strain on her body.
- Taking into account B.A.'s current physical condition, including her elevated serum ferritin (1000 ng/mL) and iron accumulation due to thalassemia, a physical activity plan requiring expertise was created. This plan was designed to avoid overexertion while enhancing cardiovascular health and

overall fitness. The plan was carefully explained to B.A., emphasizing the need to balance exercise with rest to prevent complications from both anemia and diabetes.

Evaluation: B.A. began to implement the determined physical activity plan regularly. A decrease in restrictions in daily life activities was observed, and symptoms of fatigue and weakness improved.

2.1.5. Sleep and rest

The deterioration in sleep quality due to thalassemia causes B.A. to have difficulty in falling asleep and staying asleep at night. This situation further increases the symptoms of fatigue and weakness. B.A. should be guided to establish a regular sleep pattern and pay attention to sleep hygiene, which should have a positive effect on her sleep.

Nursing diagnosis 5: Ineffective sleep pattern

Domain 4: Activity / rest

Class 1: Sleep-Rest

Descriptive features: The deterioration in sleep quality due to thalassemia. The patient's difficulty in falling asleep and staying asleep at night, along with increased symptoms of fatigue and weakness.

Objective: To improve B.A.'s sleep quality and make her feel more rested. To reduce B.A.'s difficulty in falling asleep and staying asleep at night by establishing a sleep routine.

Initiatives:

- B.A. was directed to methods such as cognitive behavioral therapy (CBT) to develop strategies for coping with insomnia. Given her high HbA1c level (9.2%) and the potential impact of uncontrolled blood sugar on sleep disturbances, CBT was tailored to address any psychological factors contributing to sleep issues, including stress and anxiety related to her diabetes and thalassemia.
- B.A. was given training on sleep hygiene and guidance on establishing a regular sleep schedule. This included practical tips to improve her sleep environment and ensure she could maintain a consistent sleep-wake cycle. Given her fluctuating energy levels due to low hemoglobin (7.2 g/dL) and anemia, establishing a balanced routine was emphasized to prevent the exhaustion that can further disrupt her sleep.
- One-on-one interviews were conducted with B.A. to assess her sleep habits and difficulties. Factors such as her late-night blood glucose monitoring, any physical discomfort due to thalassemia (such as joint pain or fatigue), and the challenges posed by her diabetes management, including the need for insulin therapy, were explored to better understand her sleep patterns and identify barriers to restful sleep.

Evaluation: B.A. showed improvement in her sleep by adhering to recommended sleep hygiene, with a decrease in difficulties in falling and staying asleep at night, as well as improvement in symptoms of fatigue and weakness. Our instance gave the quality of sleep as it is now a 4 out of 5.

2.1.6. Cognitive perception

The deterioration in cognitive and perceptual functions due to thalassemia causes B.A. to have difficulty in attention, focus and learning. In order to overcome this situation, a special cognitive rehabilitation program can be applied to B.A.

Nursing Diagnosis 6: Impaired memory

Domain 5: Perception / cognition

Class 4: Cognition

Descriptive features: The deterioration in cognitive functions due to thalassemia. The patient's difficulty in attention, focus and learning.

Objective: To increase B.A.'s attention and focus skills To be more effective in daily life activities. To overcome difficulties in learning. To access information more effectively.

Initiatives:

- B.A. was given a special cognitive rehabilitation program and taught strategies to improve her cognitive and perceptual functions. This was particularly important considering her elevated HbF levels (80%), which may impact cognitive function in patients with thalassemia, as well as the potential cognitive challenges related to poor blood glucose control (HbA1c of 9.2%) and fluctuating energy levels due to anemia.
- B.A. was interviewed one-on-one to assess attention and focus issues. Her low hemoglobin level (7.2 g/dL) and anemia could contribute to difficulties in concentration and focus, which were discussed during the interview. The impact of hyperglycemia, as indicated by her fasting blood glucose level of 180 mg/dL, on cognitive abilities was also considered as a possible contributing factor.
- B.A. was given training to support her in learning and develop her learning strategies. This approach was adapted to her

condition, taking into account the fatigue and cognitive strain associated with her thalassemia and diabetes. Personalized strategies were introduced to help her overcome barriers to effective learning and support her in managing both her physical and cognitive health.

Evaluation: By regularly implementing the specified cognitive rehabilitation program, B.A. increased her attention and focus skills, and showed a decrease in her learning difficulties. She also showed improvement in her attention deficit and hyperactivity symptoms by focusing more effectively on her daily living activities.

2.1.7. Self-Perception and self

The negative changes in self-perception experienced by B.A. due to thalassemia cause her to feel incomplete due to the anxiety of chronic disease. Therefore, psychological support provided to B.A. may contribute to the development of a positive self-concept.

Nursing diagnosis 7: Chronic inadequate self-esteem

Domain 6: Psychosocial Status

Class 2: Self-esteem

Descriptive features: The negative changes in self-perception experienced due to thalassemia. The patient's feeling of incompleteness due to chronic disease anxiety.

Objective: To increase B.A.'s self-esteem so that she can develop a positive self-concept. To reduce her difficulties in coping with chronic disease anxiety.

Initiatives:

- Psychosocial counseling services were recommended to B.A. to provide emotional support and emotional healing. Given her complex medical conditions, including thalassemia and type 1 diabetes, the counseling focused on helping her cope with the emotional burden of managing chronic illnesses. Emotional support was emphasized, particularly considering the psychological effects of anemia, cognitive challenges, and difficulties managing her blood glucose levels (HbA1c of 9.2%).
- Guidance conversations were held with B.A. to help her remember her own strengths and successes. These conversations aimed to boost her self-esteem, recognizing her ability to manage both her health conditions and daily responsibilities despite the challenges posed by her low hemoglobin (7.2 g/dL), fatigue, and the impact of diabetes. This helped B.A. focus on positive aspects of her resilience and capabilities.
- One-on-one interviews were held with B.A., and in-depth conversations were conducted about self-perception and illness concerns. These discussions focused on B.A.'s understanding of her conditions—thalassemia, with its iron overload and anemia, and type 1 diabetes, with its impact on daily life and overall well-being. The goal was to help B.A. reframe her experience with illness in a way that promotes emotional healing and self-empowerment, as well as to address any fears or anxieties she had about her health.

Evaluation: With the psychological support provided, B.A. showed an increase in self-esteem, improved coping skills with chronic disease anxiety, and began to evaluate herself more positively. The patient was more successful in recognizing her strengths.

2.1.8. Role-relationship

Having difficulty in fulfilling her roles and responsibilities due to thalassemia, B.A. has difficulty in focusing on school and housework due to symptoms of fatigue and weakness. At this point, the support provided by her family can help B.A. overcome these difficulties more effectively.

Nursing Diagnosis 8: Ineffective Role Performance

Domain 7: Role relationship

Class 3: Role performance

Descriptive features: Difficulty in fulfilling roles and responsibilities due to thalassemia. The patient's symptoms of fatigue and weakness make it difficult to focus on school and household chores.

Objective: To enable B.A. to fulfill her roles and responsibilities more effectively and to focus more effectively on her daily activities by reducing symptoms of fatigue and weakness.

Initiatives:

- B.A. was given training on rest strategies and activity planning to manage her energy levels more effectively. This training took into account her low hemoglobin level (7.2 g/dL) and the resulting fatigue from anemia, as well as the impact of fluctuating blood glucose levels (HbA1c of 9.2%) on her energy. A tailored plan was created to help B.A. balance rest with light physical activity, minimizing fatigue while promoting overall health.

- One-on-one interviews were conducted with B.A. to identify the difficulties in fulfilling her roles and responsibilities. The interviews focused on challenges related to her medical conditions, such as her difficulty in completing daily tasks due to fatigue, anemia, and the cognitive effects of both thalassemia and diabetes. Specific attention was given to how her physical and emotional health impacts her ability to manage daily life.
- Family members were informed about the difficulties B.A. was experiencing and were made aware of how to provide support. This included educating the family on the importance of managing her condition, including dietary adjustments, medication adherence, and understanding her energy limitations due to her anemia and diabetes. Strategies for emotional and practical support were also discussed to help B.A. navigate her daily responsibilities more effectively.

Evaluation: B.A. showed improvement in fulfilling her roles and responsibilities more effectively. The family took on a more conscious and active role in providing support for B.A.'s difficulties. The patient's symptoms of fatigue and weakness decreased, and she began to focus more effectively on her daily activities.

2.1.9. Sexuality and reproduction

B.A. has a knowledge deficit about sexuality and reproductive health. It is critical that she receives sexuality and reproductive health education as she is in puberty and adapting to abnormal changes in her body. At this point, it is important for B.A. to receive support from a trusted adult or expert in order to have a healthy sexual development process.

Although there is no specific definition in NANDA nursing diagnoses regarding this issue, the patient's lack of knowledge about sexual identity poses a potential risk for future problems. Therefore, appropriate actions have been taken to assess the situation and provide the necessary interventions for the patient's benefit.

Descriptive features: B.A. had a lack of knowledge about sexual and reproductive health and was in the process of adapting to abnormal changes in her body due to the patient being in puberty.

Objective: To increase B.A.'s level of knowledge on sexual and reproductive health. To enable her to undergo a healthy sexual development process and to adapt to these changes by being consciously informed about body changes.

Initiatives:

- B.A. was provided with educational materials about body changes specific to puberty and sexuality. These materials were tailored to her needs, taking into account her medical conditions, such as thalassemia and type 1 diabetes. The content addressed how these conditions might influence physical and hormonal changes during puberty, helping B.A. understand what to expect during this stage of her life.
- B.A. was guided to seek support from a trusted adult or expert. Considering her health conditions, which may sometimes cause emotional distress or confusion about her bodily changes, it was emphasized that she should reach out to healthcare professionals or family members who are informed and supportive. This ensures she has reliable sources to turn to when questions or concerns arise about her sexual health or puberty.
- One-on-one interviews were conducted with B.A. to identify a lack of knowledge about sexuality and reproductive health. These conversations helped uncover any gaps in her understanding, especially in relation to how her medical conditions, such as the impact of diabetes on menstrual cycles or potential fertility issues associated with thalassemia, could affect her reproductive health. Personalized guidance was provided to ensure she received accurate information to navigate these aspects of her development.

Evaluation: B.A. showed an increase in her level of knowledge about sexuality and reproductive health. She was previously unable to comment on this issue, but now she can. She has also become more conscious of body changes and sexuality. She has gained more confidence in going through a healthy sexual development process and has begun to embrace receiving support.

2.1.10. Coping – stress tolerance

Having difficulty in coping with the stress and anxiety she experiences due to thalassemia, B.A. struggles with stress from time to time because her peers are in formal education and she has to continue with open education. Providing B.A. with stress coping skills, teaching stress reduction techniques and applying relaxation methods can help in this process.

Nursing diagnosis 10: Maladaptive coping

Domain 9: Coping / stress tolerance

Class 2: Coping responses

Descriptive features: Having difficulty in coping with the stress and anxiety she experiences due to thalassemia. The need to deal with stress from time to time because she has to continue with open education, unlike her peers who are in formal education.

Objective: To increase B.A.'s skills in coping with stress so that she can manage it more effectively in her daily life. To increase her quality of life by reducing her stress level.

Initiatives:

- B.A. was given training on stress reduction techniques and relaxation methods. Given her challenging health conditions, including thalassemia and type 1 diabetes, stress management became a priority. The training focused on methods such as deep breathing, mindfulness, and progressive muscle relaxation to help her reduce stress, which can negatively affect both her emotional and physical health, particularly with her elevated HbA1c (9.2%) and fatigue due to anemia.
- One-on-one meetings were held with B.A., and discussions were held on strategies for coping with stress. These conversations were personalized to address the unique stressors B.A. faces, including managing chronic conditions, maintaining a healthy lifestyle, and coping with emotional and physical symptoms like fatigue (due to low hemoglobin) and the impact of fluctuating blood glucose levels.
- Regular supportive conversations were held to support B.A.'s process of coping with stress. These ongoing discussions aimed to provide continuous emotional support, helping B.A. feel empowered and more in control of her emotional responses to the daily challenges she faces due to her medical conditions. Through these conversations, coping strategies were reinforced, and B.A. was encouraged to build a support system around her.

Evaluation: B.A. showed an increase in her stress coping skills and began to apply these skills effectively in her daily life. Her stress level decreased. A positive change in her quality of life was observed. She began to cope with stress more effectively thanks to supportive conversations and applied stress reduction techniques.

2.1.11. Value- belief

B.A. and her family have strong religious beliefs. These beliefs positively affect the treatment process. In this context, B.A.'s religious beliefs should be evaluated as part of the treatment process.

3. Discussion

Patient B.A.'s complications related to thalassemia and diabetes, as well as her physical and mental experiences after the diagnosis of thalassemia, were addressed with a holistic perspective and evaluated in 11 areas according to Gordon's Functional Health Patterns Model. Based on these evaluations, necessary nursing diagnoses (NANDA 2024-2026) were made, and appropriate interventions were implemented.

Gordon's Functional Health Patterns Model offers a comprehensive approach to assessing both the physical and mental health of thalassemia patients (Keklik et al., 2023). The assessment conducted using this model was a valuable tool for identifying potential problems that could affect the patient's quality of life, as well as planning effective interventions (Cin and Hintistan, 2022). The nursing diagnoses and interventions developed from this model reflect significant improvements in B.A.'s ability to cope with her health conditions.

B.A.'s health issues related to diabetes and thalassemia were comprehensively addressed within the framework of Gordon's Functional Health Patterns Model. This model allowed for a holistic assessment of her physical and psychological condition. The laboratory results show that B.A.'s high HbA1c (9.2%) and fasting blood glucose levels indicate poor diabetes control. However, interventions such as stress management and psychosocial counseling have been effective in improving her emotional resilience, leading to positive changes in her quality of life. Additionally, the elevated reticulocyte count (7.5%) reflects an attempt to increase red blood cell production, indicating that with proper management, her functional abilities are improving. Gordon's model has proven effective in helping B.A. develop healthy lifestyle habits, as seen in the successful outcomes of interventions like cognitive rehabilitation, sleep hygiene training, and nutritional management, which increased her participation in daily life activities. Furthermore, the model played a crucial role in alleviating the emotional burden of diabetes, boosting B.A.'s self-esteem, and enabling her to manage her health more effectively. In this context, the application of Gordon's Model has supported B.A.'s health management and quality of life improvement, leading to successful results.

After implementing interventions for maladaptive coping, including stress management techniques and psychosocial counseling services, B.A. was able to cope with stress more effectively, leading to a positive change in her quality of life. The

laboratory results, including her high HbA1c (9.2%) and blood glucose levels, indicate the significant stress related to her diabetes. Stress management strategies helped improve her emotional resilience and overall well-being.

For the diagnosis of ineffective role performance, family awareness and energy management training were provided. As a result, B.A. showed improvements in her ability to engage in daily activities. This was supported by her elevated reticulocyte count (7.5%), which reflects an attempt to increase red blood cell production, indicating that with proper management, she could improve her functional abilities.

In the diagnosis of impaired memory, B.A. participated in a cognitive rehabilitation program, which led to an improvement in her attention and focus skills. This intervention helped address the cognitive difficulties associated with her low hemoglobin (7.2 g/dL) and fluctuating glucose levels.

Regarding ineffective sleep pattern, B.A. underwent training on sleep hygiene. This resulted in improved sleep quality and reduced difficulty in falling asleep, despite the challenges of managing blood glucose levels and anemia. Training in this area addressed the physiological and emotional factors that contributed to her sleep disturbances.

For inadequate nutritional intake and ineffective adolescent eating dynamics, B.A. and her family were educated about healthy eating strategies, considering her diabetes and thalassemia. This led to an increase in B.A.'s knowledge about her dietary needs, helping her take more conscious steps towards proper nutrition. The high serum ferritin (1000 ng/mL) and iron overload associated with thalassemia were also addressed through this education, ensuring that B.A. understood how to balance her iron intake.

For impaired physical mobility, a regular exercise program was implemented, which resulted in an improvement in B.A.'s ability to participate in daily life activities. The program was tailored to her health conditions, particularly taking into account her anemia and the need for a careful balance of exercise and rest.

In the diagnosis of inadequate health self-efficacy, one-on-one interviews and health education sessions focused on helping B.A. perceive her health status more effectively. These interventions contributed to her ability to manage her health better and reduced restrictions in her daily activities.

Finally, chronic inadequate self-esteem was addressed through psychosocial counseling. B.A.'s self-esteem increased as a result of focused interventions, and her ability to cope with illness-related anxiety improved. This was particularly important in light of her chronic conditions, such as the emotional burden caused by the fluctuating hemoglobin and glucose levels.

4. Conclusion and Recommendations

The findings of the study show that Gordon's Functional Health Patterns Model is an important tool for providing effective care to thalassemia patients. It is important to evaluate this model, which shows increases in the patient's quality of life, for chronic diseases such as thalassemia and to inform health professionals about this model. However, it should not be forgotten that a single case report may not provide sufficient data for the care of a general disease population. It is recommended that studies be conducted with a larger number of cases on this subject and the effects of this model on thalassemia patients be examined in detail.

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Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.

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