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Conceptual Analysis of Fear of Hypoglycemia in Diabetic Patients

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Abstract: *This study aims to clarify the definition and connotation of hypoglycemia fear in diabetic patients. A systematic search of Chinese and English databases was performed, and Walker and Avant's classic concept analysis method was employed to analyze the concept of hypoglycemia fear. A total of 43 articles were included. Hypoglycemia fear consists of three attributes: excessive coping behaviors, concern about adverse consequences, and negative emotions. The antecedent factors include general demographic factors, disease-related factors, and a history of hypoglycemia. Include self-management ability, quality of life, self-efficacy, and treatment adherence. The concept analysis method clarified the attributes, antecedent factors, and outcomes of hypoglycemia fear, providing a valuable reference for the development of future hypoglycemia fear assessment tools and intervention studies.*

Keywords: *Diabetes Mellitus, Fear of Hypoglycemia, Fear, Concept Analysis*

1. Introduction

According to the latest report published by The Lancet[1], in 2022, 828 million people (adults aged 18 and above) worldwide were diagnosed with diabetes, an increase of 630 million (from 554 million to 713 million) compared to 1990. Hypoglycemia is a common complication of diabetes[2], with primary symptoms including sweating, palpitations, dizziness, and hunger. In severe cases, it can lead to loss of consciousness, seizures, and even death. During the blood glucose management process, the risk of hypoglycemia often accompanies patients, and it remains the main limiting factor in achieving blood glucose control in diabetic patients[3]. Research shows[4] that up to 35% of diabetic patients report experiencing 2 to 4 or more hypoglycemic episodes each week. Repeated hypoglycemic events often lead to the development of fear of hypoglycemia (FOH), which further affects blood glucose control and treatment adherence in diabetic patients[5]. Currently, there is no consensus among scholars, both domestically and internationally, on the concept of FOH, and the oversimplification of the concept in practice has hindered in-depth research into FOH. Concept analysis is a method used to deconstruct terms and clarify and define ambiguous concepts, which has been widely applied in various disciplines such as philosophy, social sciences, nursing, and psychology[6]. This study employs the Walker and Avant concept analysis method[7] to clarify the concept of FOH, define its defining attributes, and aims to provide a reference for research and practice in the field of FOH.

2. Methods

2.1 Search Strategy

A comprehensive literature search was conducted in both Chinese and international databases from their inception to December 1, 2024. The Chinese databases included CNKI, Wanfang Data, VIP Information, and SinoMed. The international databases included PubMed, Web of Science, CINAHL, Embase, and the Cochrane Library. Search terms included “diabetic patients,” “Diabetes Mellitus,” “Type 1 Diabetes Mellitus,” “Type 2 Diabetes Mellitus,” “health literacy,” “fear of hypoglycemia,” “hypoglycemic fear,” and “hypoglycemia worries.”

2.2 Literature Analysis

Concept analysis was performed using the Walker and Avant method[7], which consists of eight steps: Select the concept of fear of hypoglycemia (FOH); Define the purpose of the analysis; Clarify all uses of

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the concept; Identify the defining attributes of the concept; Define typical cases; Define critical and opposing cases; Analyze the antecedents and consequences; Identify empirical measurement tools.

3. Results

3.1 Etymological Explanation

The term "fear of hypoglycemia" is derived from the combination of two sub-concepts: hypoglycemia and fear. According to the International Hypoglycemia Study Group[8] (IHSG), hypoglycemia is defined as a blood glucose level lower than 70 mg/dL (3.9 mmol/L). The Oxford English Dictionary (OED) defines "fear" as a noun in the following ways: 1) an emotional response to the potential danger or pain that may occur in the future, which may manifest as anxiety, unease, or a state of fear. 2) an emotional response towards a specific or non-specific object (such as a person, animal, event, etc.), which may be accompanied by avoidance behavior. The Modern Chinese Dictionary defines "fear" as a feeling of panic and fear, a state of being frightened and uneasy.

3.2 Application of the Concept in the Literature

The concept of Fear of Hypoglycemia (FOH) was first introduced by Cox et al.[9] in 1987, who proposed that FOH is an emotional and behavioral response triggered by the potential risks of hypoglycemia (hypoglycemic episodes). Wild et al.[10] later suggested that FOH is a significant feeling of anxiety caused by the discomfort and negative effects brought on by hypoglycemia. In 2011, Gonder-Frederick et al.[11] argued that FOH is similar to anxiety, but more severe than anxiety itself. In 2013, Böhme et al.[12] further pointed out that FOH is a psychological issue, defining it as the anxiety that diabetic patients experience due to concerns about hypoglycemic events, which negatively impact their quality of life and diabetes management. In 2017, Huang Shuo-guo et al.[13] described FOH as a negative emotional experience that leads to behavioral changes in diabetic patients due to the threat of hypoglycemia's adverse consequences. Cheng Kang-yao et al.[14] believed that FOH refers to the discomfort experienced during hypoglycemia and the potential threat to life. In 2022, Huang et al.[15] stated that the obvious discomfort of hypoglycemia, the harm it causes to the individual, and its unpredictability lead to a fear of hypoglycemia in patients. In summary, FOH is an emotional and behavioral response triggered by the potential risk of hypoglycemia. Patients often engage in excessive coping behaviors to avoid hypoglycemia, developing an excessive concern about its consequences, and are accompanied by intense negative emotional experiences.

3.3 Conceptual Attributes

3.3.1 Excessive Coping Behaviors

Excessive coping behaviors refer to unnecessary or exaggerated reactions taken by patients due to an excessive fear or anxiety about hypoglycemic symptoms. The excessive coping behaviors to avoid hypoglycemia are widely regarded as one of the main attributes of Fear of Hypoglycemia (FOH). These behaviors primarily include increased vigilance with snack consumption and exercise limitation[16], self-reducing medication doses or even discontinuing medication[17,18], and maintaining high blood glucose levels [19]. A study by Xu Hongmei[16] found that excessive coping behaviors not only occur in hypoglycemia prevention but are even more pronounced after hypoglycemic episodes. Although these behaviors are intended to protect oneself, they may negatively impact disease management, even leading to unstable blood glucose control[20].

3.3.2 Worry About Negative Consequences

The potential unpredictability of hypoglycemic events causes diabetic patients to feel anxious or worried about hypoglycemia. Even when blood glucose levels may not decrease, patients worry about the symptoms or consequences of hypoglycemia, including acute fear of adverse health outcomes, uncontrolled cognitive impairment, and inappropriate behavior or accidental injury in social settings[21]. A qualitative study indicated[16] that patients expressed reluctance to drive alone, fearing that hypoglycemia might affect their ability to drive. Additionally, this sense of worry can lead patients to adopt improper self-management behaviors, resulting in unstable blood glucose control[22].

3.3.3 Negative Emotions

FOH is associated with negative emotions or negative emotional experiences triggered by

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hypoglycemic episodes. Hypoglycemia induces feelings of tension and fatigue, which are highly unpleasant. Many people experience negative emotional responses such as anxiety, depression, anger, and embarrassment when their blood sugar is low, displaying noticeable pessimism and negative feelings [20]. Studies show that nearly half of diabetic patients experience psychological symptoms such as depression, anxiety, and fear due to hypoglycemia[23]. Research Anderbro et al.[24] indicates a clear link between FOH and hypoglycemic experiences, and the higher the risk of hypoglycemia, the more pronounced the psychological responses in individuals.

3.4 Typical Case

A literature search revealed one representative typical case[25]. Maddie, a 48-year-old woman, is married with one child and was diagnosed with type 2 diabetes 10 years ago. To control her blood sugar, she has been using multiple daily insulin injections for 6 years. A few years ago, Maddie experienced a severe hypoglycemic event that led to a seizure. Since then, the fear of hypoglycemia has deeply troubled her (negative emotions). As her fear of hypoglycemia intensified, Maddie's blood sugar management became increasingly difficult. Her HbA1c increased from 7.5% to 9.9%, and her blood sugar control worsened. She often experienced mild discomfort, such as a rapid heartbeat and cold extremities, and mistakenly believed her blood sugar might be too low. Even after checking and finding her blood sugar to be normal, she still felt extremely uneasy, as though hypoglycemia could occur at any moment. To avoid this feeling, Maddie began skipping insulin injections, frequently checking her blood sugar, avoiding exercise, and overeating every night (excessive coping behaviors). She was worried she might experience hypoglycemia while sleeping (worry about negative consequences). Despite understanding that excessive blood sugar fluctuations could affect her health and her desire to improve blood sugar control, she continuously refused to follow the medical team's advice and was unable to overcome her extreme fear of hypoglycemia.

3.5 Preceding Factors

3.5.1 Demographic Factors

Gender, economic status, education level, age, living alone, and the duration of diabetes are closely related to FOH. Research by Zhao Ying et al.[26] Shows that female patients tend to be more emotionally sensitive and reactive, making them more likely to experience stronger emotions about FOH during blood sugar management. Patients with poorer economic conditions have higher levels of fear[27]; individuals with lower economic levels have limited access to medical and educational resources, leading to greater stress, which may exacerbate the fear related to diabetes management. Those with higher educational levels exhibit lower levels of fear, as they are better equipped with knowledge and coping strategies to control diabetes, thus reducing their fear. FOH also shows age-related differences. A study by Sakane et al.[28]. Suggests that as age increases, cognitive function may decline, and the understanding and memory of hypoglycemia-related knowledge decrease. This leads to inaccurate risk assessments of hypoglycemia and increased fear of it. Additionally, as aging progresses, physical functions begin to decline, and the degree of frailty increases, which makes patients feel more helpless when facing the disease[29]. Research shows[15] that when patients require assistance, those who live alone are unable to receive timely help from their surrounding community, which increases their fear of hypoglycemia. As the duration of the disease extends, complications begin to manifest, and the physical and mental burden increases, leading to a heightened sense of fear[30].

3.5.2 Disease-related Factors

The type of diabetes, treatment methods, and impaired hypoglycemia perception are closely related to patients' FOH. A study by Mu Chun[31]. Found that type 1 diabetes patients have a higher frequency of hypoglycemia and severe hypoglycemia compared to type 2 diabetes patients, which creates a significant psychological burden and makes them more prone to fear. Huang[15] found that insulin therapy is closely associated with FOH in type 2 diabetes patients. Patients receiving insulin therapy for type 2 diabetes have higher levels of FOH compared to those using only diet or exercise treatments. Patients receiving intensive insulin therapy are more worried and fearful of hypoglycemia than those receiving standard insulin therapy. Impaired hypoglycemia awareness is a risk factor for severe hypoglycemia, leading to an increased incidence of severe hypoglycemic events and a higher level of FOH[32].

3.5.3 History of Hypoglycemia

The severity, frequency, and occurrence of nocturnal hypoglycemia all influence the level of FOH in

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patients. A study by Anderbro et al.[32]. Indicated that past severe hypoglycemic events increase the probability of experiencing unpleasant events again and the risk of life-threatening events. Individuals who have experienced severe hypoglycemia are likely to develop a greater fear of future hypoglycemic episodes. The level of FOH increases with the frequency of hypoglycemia[30]. One possible reason for this is that diabetic patients often view recurrent hypoglycemia as a sign of worsening their condition. As hypoglycemia recurs, the stress of managing the disease increases, adding a psychological burden that leads to FOH. When hypoglycemia occurs frequently, patients' ability to cope with impending hypoglycemic episodes is also affected, potentially even becoming uncontrollable, leading to more severe FOH. During sleep, diabetic patients often have difficulty detecting and noticing hypoglycemia, leading to a fear of the consequences of hypoglycemic events afterward[24].

3.6 Consequent Outcomes

3.6.1 Self-Management Ability

Due to the fear of hypoglycemia, diabetic patients may engage in behaviors such as adjusting medication doses, frequently monitoring blood glucose, overeating, and insufficient physical activity[33]. The level of FOH has varying effects on patients' self-management. When the FOH level is low, it may encourage patients to enhance their self-management behaviors. Some patients, due to the fear of blood glucose fluctuations, may become more disciplined in managing their health. However, patients with high levels of FOH may take excessive intervention measures to maintain their blood glucose at high levels [34]. Additionally, studies have shown that the higher the level of FOH, the more frequently patients monitor their blood glucose to stay aware of their levels, and they may overeat (beyond their usual intake) to prevent hypoglycemia and alleviate FOH[33].

3.6.2 Quality of Life

FOH impacts the quality of life in type 2 diabetes patients, affecting areas such as physical activity levels, anxiety, depression, daily activities, mobility, pain, and discomfort[35]. Research has shown that FOH has a positive impact on quality of life, as patients make positive behavioral changes due to the fear of hypoglycemia, which significantly enhances their overall quality of life[36].

3.6.3 Treatment Adherence

Fear of hypoglycemia is one of the main barriers to treatment adherence. As FOH increases, treatment adherence continues to decline[35]. To prevent hypoglycemia, patients may keep their blood glucose at high levels, exhibiting negative self-management behaviors such as reducing insulin doses, overeating, and reducing physical activity. This leads to impaired metabolic control variables and decreased treatment adherence[37].

3.6.4 Other Factors

Research has shown that FOH is significantly correlated with sleep quality. The higher the level of FOH, the worse the sleep quality[38]. Poor sleep quality may be due to insulin resistance and metabolic disturbances that threaten health, conditions commonly seen in type 1 diabetes (T1MD) patients. Poor sleep quality may lead to higher blood glucose levels and FOH, while high levels of fear negatively impact both blood glucose control and sleep quality. The higher the FOH level in patients, the lower their sense of self-efficacy[39], which may affect their self-efficacy by altering behaviors such as exercise, diet, medication, and blood glucose monitoring.

3.7 Empirical Assessment Indicators

3.7.1 Hypoglycemic Fear Survey (HFS)

The HFS was developed by Cox et al.[9]. in 1987, designed to assess the fear of hypoglycemia in type 1 diabetes patients. The survey includes two dimensions: behavior (10 items) and worry (17 items). The scale uses a 5-point Likert scale, with total scores ranging from 27 to 135 points, where higher scores indicate a higher degree of FOH. The Cronbach's alpha coefficient for the scale is 0.90, indicating good internal consistency. In 2011, the original authors revised it and developed the second edition of the Hypoglycemia Fear Survey (HFS-II)[40], which increased the number of items from 27 to 33. The HFS-II includes two subscales: the Behavioral Subscale (HFS-B) and the Worry Subscale (HFS-W). The HFS-B includes 15 items, used to assess diabetes patients' behavioral responses to avoid hypoglycemia, while the HFS-W includes 18 items to assess concerns and emotional reactions to hypoglycemia. The revised scale has a Cronbach's alpha coefficient of 0.94, showing good internal consistency. The HFS is the most

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widely used scale, with over 50 translated versions, and is effective at identifying patients with higher levels of FOH.

3.7.2 15-Item Fear of Hypoglycemia Scale (FH-15)

The FH-15 was developed by Teresa et al. in 2011 to assess FOH in type 1 diabetes patients[41]. This scale includes three dimensions: Fear, Avoidance, and Interference, with a total of 15 items. It uses a 5-point Likert scale, where 1 indicates "never" and 5 indicates "every day." Higher scores represent greater FOH, with a score of 28 or higher classified as significant FOH. The Cronbach's alpha coefficient for the scale is 0.89, and the internal consistency for the subscales is also good (Fear dimension: 0.875, Avoidance dimension: 0.841, Interference dimension: 0.838).

3.7.3 Hypoglycemic Attitudes and Behavior Scale (HABS)

The HABS was developed by Polomsky et al.[42] in 2015 to primarily measure the concerns, avoidance behaviors, and confidence levels regarding hypoglycemia in type 2 diabetes patients. The scale includes three dimensions: hypoglycemic anxiety, hypoglycemic avoidance, and hypoglycemic confidence. The scale consists of 14 items, assessed using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The score for each dimension is derived from the average of the related items, with higher scores indicating greater anxiety, avoidance, or confidence regarding hypoglycemia. The scale demonstrates good internal consistency. For the anxiety dimension, the Cronbach's alpha coefficient is 0.85 for insulin users and 0.83 for non-insulin users. For the avoidance dimension, the Cronbach's alpha coefficient is 0.77 for insulin users and 0.74 for non-insulin users. For the confidence dimension, the Cronbach's alpha coefficient is 0.80 for insulin users and 0.73 for non-insulin users.

4. Conclusion

This study systematically organizes the concept of FOH, including its antecedents, consequent outcomes, conceptual attributes, and assessment tools, using the classic concept analysis method by Walker and Avant. This approach provides healthcare professionals with a clearer understanding of the concept and connotations of FOH, while also offering further conceptual references for future research on FOH. In the future, more comprehensive FOH scales can be developed, combining both quantitative and qualitative research to deepen the study of FOH.

References

[1] Zhou, B., Rayner, A. W., Gregg, E. W., Sheffer, K. E., Carrillo-Larco, R. M., Bennett, J. E., ... & Can, G. (2024). Worldwide trends in diabetes prevalence and treatment from 1990 to 2022: a pooled analysis of 1108 population-representative studies with 141 million participants. The Lancet, 404(10467), 2077-2093.

[2] Hsu, P. F., Sung, S. H., Cheng, H. M., Yeh, J. S., Liu, W. L., Chan, W. L., ... & Chuang, S. Y. (2013). Association of clinical symptomatic hypoglycemia with cardiovascular events and total mortality in type 2 diabetes: a nationwide population-based study. Diabetes care, 36(4), 894-900.

[3] Cheng, A. Y. (2013). Canadian Diabetes Association Clinical Practice Guidelines Expert Committee: Canadian diabetes association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes, 37(Suppl 1), S1-S3.

[4] Allen, C., LeCaire, T., Palta, M., Daniels, K., Meredith, M., D'Alessio, D. J., & Wisconsin Diabetes Registry Project. (2001). Risk factors for frequent and severe hypoglycemia in type 1 diabetes. Diabetes care, 24(11), 1878-1881.

[5] Cox, D. J., Gonder-Frederick, L., Antoun, B., Clarke, W., & Cryer, P. (1990). Psychobehavioral metabolic parameters of severe hypoglycemic episodes. Diabetes Care, 13(4), 458-459.

[6] Li, Q. G., Hu, J. L., Zheng, Y. W., & Ruan, H. (2018). Concept analysis and its application in nursing. Journal of Nursing Science, 33(4), 100-102.

[7] Walker, L. O., & Avant, K. C. (2005). Strategies for theory construction in nursing (Vol. 4). Upper Saddle River, NJ: Pearson/Prentice Hall.

[8] Ratner, R. E. (2018). Hypoglycemia: new definitions and regulatory implications. Diabetes technology & therapeutics, 20(S2), S2-50.

[9] Cox, D. J., Irvine, A., Gonder-Frederick, L., Nowacek, G., & Butterfield, J. (1987). Fear of hypoglycemia: quantification, validation, and utilization. Diabetes care, 10(5), 617-621.

[10] Wild, D., von Maltzahn, R., Brohan, E., Christensen, T., Clauson, P., & Gonder-Frederick, L. (2007). A critical review of the literature on fear of hypoglycemia in diabetes: implications for diabetes

ISSN 2618-1584 Vol. 7, Issue 3: 134-140, DOI: 10.25236/FMSR.2025.070318

management and patient education. Patient education and counseling, 68(1), 10-15.
[11] Gonder-Frederick, L., Nyer, M., Shepard, J. A., Vajda, K., & Clarke, W. (2011). Assessing fear of hypoglycemia in children with type 1 diabetes and their parents. Diabetes Management (London, England), 1(6), 627.
[12] Böhme, P., Bertin, E., Cosson, E., Chevalier, N., & GEODE group. (2013). Fear of hypoglycaemia in patients with type 1 diabetes: do patients and diabetologists feel the same way. Diabetes & metabolism, 39(1), 63-70.
[13] Xiao, H. S. L. P. (2017). Research progress on fear of hypoglycemia in patients with type 1 diabetes mellitus. Chinese Journal of Nursing, 52(07), 820-825
[14] CHENG Kangyao, W. X. L. W. (2021). Research progress on influencing factors and intervention measures of fear of hypoglycemia in patients with type 2 diabetes mellitus. Chinese Nursing Research, 35(04), 665-668
[15] Huang, J., Peng, W., Ding, S., Xiong, S., Liu, Z.. "Fear of hypoglycemia and associated factors in hospitalized patients with type 2 diabetes: a cross-sectional study." Scientific reports 12, no. 1 (2022): 20338.
[16] Xu Hongmei, D. W. M. C. (2016). A qualitative research on the behaviors caused by fear of hypoglycemia in type 2 diabetic patients. Chinese Journal of Practical Nursing, 32 (31), 2429-2432.
[17] Shi, L., Shao, H., Zhao, Y., & Thomas, N. A. (2014). Is hypoglycemia fear independently associated with health-related quality of life?. Health and quality of life outcomes, 12, 1-9.
[18] Driscoll, K. A., Raymond, J., Naranjo, D., & Patton, S. R. (2016). Fear of hypoglycemia in children and adolescents and their parents with type 1 diabetes. Current diabetes reports, 16, 1-9.
[19] Leiter, L. A., Yale, J. F., Chiasson, J. L., Harris, S., Kleinstiver, P., & Sauriol, L. (2005). Assessment of the impact of fear of hypoglycemic episodes on glycemic and hypoglycemia management. Can J Diabetes, 29(3), 186-192.
[20] Frier, B. M. (2008). How hypoglycaemia can affect the life of a person with diabetes. Diabetes/metabolism research and reviews, 24(2), 87-92.
[21] Zhang, Y., Li, S., Zou, Y., Wu, X., Bi, Y., Zhang, L., ... & Hayter, M. (2021). Fear of hypoglycaemia in patients with type 1 and 2 diabetes: a systematic review. Journal of Clinical Nursing, 30(1-2), 72-82.
[22] Grammes, J., Schäfer, M., Benecke, A., Löw, U., Klostermann, A. L., Kubiak, T., & Witthöft, M. (2018). Fear of hypoglycemia in patients with type 2 diabetes: the role of interoceptive accuracy and prior episodes of hypoglycemia. Journal of psychosomatic research, 105, 58-63.
[23] Sakane, N., Kotani, K., Tsuzaki, K., Nishi, M., Takahashi, K., Murata, T., ... & Yamamoto, T. (2015). Fear of hypoglycemia and its determinants in insulin-treated patients with type 2 diabetes mellitus. Journal of Diabetes Investigation, 6(5), 567-570.
[24] Anderbro, T., Gonder-Frederick, L., Bolinder, J., Lins, P. E., Wredling, R., Moberg, E., ... & Johansson, U. B. (2015). Fear of hypoglycemia: relationship to hypoglycemic risk and psychological factors. Acta diabetologica, 52, 581-589.
[25] Polonsky, W. H., Guzman, S. J., & Fisher, L. (2023). The hypoglycemic fear syndrome: understanding and addressing this common clinical problem in adults with diabetes. Clinical Diabetes, 41(4), 502-509.
[26] ZHAO Ying, L. Y. C. X. (2020). Analysis of the present situation of hypoglycemic fear in diabetic patients and its influencing factors. Chinese Nursing Management, 20(01), 26-31
[27] Salimi, H. R., Zarei, F., Hosseinali, M., & Rashvand, F. (2024). Predictive factors of fear of hypoglycemia in type 2 diabetes patients; an analytical study on the role of hypoglycemic episodes and their interpretation. Journal of Preventive Epidemiology, 10(1), e38255-e38255.
[28] Sakane, N., Kotani, K., Tsuzaki, K., Nishi, M., Takahashi, K., Murata, T., ... & Yamamoto, T. (2015). Fear of hypoglycemia and its determinants in insulin-treated patients with type 2 diabetes mellitus. Journal of Diabetes Investigation, 6(5), 567-570.
[29] Tang, Q., Wang, J., Su, S., Xia, Y., Yu, S., Ren, Q., ... & Feng, S. (2025). Prevalence and factors of fear of hypoglycemia among Chinese older adults with type 2 diabetes mellitus: A cross-sectional study. Geriatric Nursing, 63, 1-7.
[30] Huang Shuoguo, L. P. Z. S. (2018). Fear of Hypoglycemia in Patients with Type 2 Diabetes Mellitusand Its Influencing Factors. Nursing Journal of Chinese People's Liberation Army, 35(07), 1-7
[31] Mu Chun, X. H. B. D. (2021). A comparative study on the fear of hypoglycemia and quality of life in patients with type 1 and type 2 diabetes mellitus. Chinese Journal of Diabetes Mellitus, 13(2), 6
[32] Anderbro, T., Amsberg, S., Adamson, U., Bolinder, J., Lins, P. E., Wredling, R., ... & Johansson, U. B. (2010). Fear of hypoglycaemia in adults with Type 1 diabetes. Diabetic Medicine, 27(10), 1151-1158.
[33] Li, S., Li, Y., Zhang, L., Bi, Y., Zou, Y., Liu, L., ... & Zhang, Y. (2022). Impact of fear of hypoglycaemia on self-management in patients with type 2 diabetes mellitus: structural equation modelling. Acta diabetologica, 59(5), 641-650.

ISSN 2618-1584 Vol. 7, Issue 3: 134-140, DOI: 10.25236/FMSR.2025.070318

[34] LI Shuang, C. Y. H. X. (2021). Prevalence and Influencing Factors of Fear of Hypoglycemia in Patients with Type 2 Diabetes Mellitus. China General Practice, 24(21), 2661-2668
[35] Yildirim, D., Çiriş Yildiz, C., Ergin, E., & Özbay, İ. (2024). Hypoglycaemia fear, treatment adherence, and the quality of life in patients with type 2 diabetes and its determinants. International Journal of Nursing Practice, 30(2), e13248.
[36] XU Hong-mei, M. C. B. D. (2018). Influencing factors of quality of life in type 2 diabetes patients with hypoglycemia experience. Chinese Journal of Nursing Education, 15(07), 530-535
[37] Yuksel, M., & Bektas, H. (2021). Compliance with treatment and fear of hypoglycaemia in patients with type 2 diabetes. Journal of Clinical Nursing, 30(11-12), 1773-1786.
[38] Martyn-Nemeth, P., Phillips, S. A., Mihailescu, D., Farabi, S. S., Park, C., Lipton, R., ... & Quinn, L. (2018). Poor sleep quality is associated with nocturnal glycaemic variability and fear of hypoglycaemia in adults with type 1 diabetes. Journal of advanced nursing, 74(10), 2373-2380.
[39] Amiri, F., Vafa, M., & Gonder-Frederick, L. (2015). Glycemic control, self-efficacy and fear of hypoglycemia among Iranian children with type 1 diabetes. Canadian Journal of Diabetes, 39(4), 302-307.
[40] Gonder-Frederick, L. A., Schmidt, K. M., Vajda, K. A., Greear, M. L., Singh, H., Shepard, J. A., & Cox, D. J. (2011). Psychometric properties of the hypoglycemia fear survey-ii for adults with type 1 diabetes. Diabetes care, 34(4), 801-806.
[41] Anarte Ortiz, M. T., Caballero, F. F., Ruiz de Adana, M. S., Rondán, R. M., Carreira, M., Domínguez-López, M., ... & Soriguer, F. C. (2011). Development of a new fear of hypoglycemia scale: FH-15. Psychological assessment, 23(2), 398.
[42] Polonsky, W. H., Fisher, L., Hessler, D., & Edelman, S. V. (2015). Identifying the worries and concerns about hypoglycemia in adults with type 2 diabetes. Journal of Diabetes and its Complications, 29(8), 1171-1176.