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The relationship between gluten-free diet adherence, maternal stress, and quality of life in children diagnosed with celiac disease: A review

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Abstract

Celiac disease (CD) is a chronic autoimmune disorder triggered by gluten consumption, subsequently affecting the small intestine and the only effective treatment for CD is a lifelong strict gluten-free diet (GFD). Furthermore, CD has been documented to have profound psychological effects on individuals, including depression, anxiety, mood disorders, and social challenges due to various factors associated with GFD. This review explores the intricate relationship between GFD adherence and its impact on mothers of children with CD. While some studies suggest a negative effect on maternal quality of life (QoL), as well as increased stress due to GFD complexity and social isolation, others report a positive effect on maternal QoL linked to improved child health and family cohesion. These discrepancies highlight the complexity of this relationship. Factors contributing to maternal stress include social isolation, difficulty accessing gluten-free (GFPs) products, and lack of healthcare support. Potential solutions include education, counselling, support networks, dietary guidance, and collaborative healthcare. Understanding the interplay between GFD adherence and maternal well-being is crucial in providing comprehensive support to mothers caring for their children with CD, which in turn, will ultimately improve the overall QoL for affected families. Further research is needed to assess the effectiveness of these strategies in diverse contexts and settings.

Keywords: celiac disease, gluten-free diet, quality of life, stress, anxiety

1. Introduction

Celiac disease (CD) is a chronic autoimmune disorder characterized by its impact on the small intestine triggered by the consumption of gluten—a protein commonly found in wheat, barley, and rye (Harvard Health, 2023). Gluten ingestion elicits an inflammatory response within the mucosa of the small intestine, resulting in villous atrophy, malabsorption, and a spectrum of clinical manifestations (Lionetti and Catassi, 2011). The disease manifests itself with a diverse array of symptoms, encompassing both gastrointestinal and extraintestinal presentations, such as diarrhea, weight loss, anaemia, osteoporosis, dermatitis herpetiformis, neurological disorders, and malignancies (Green et al., 2015). Predominant clinical presentations include failure to thrive, poor weight gain, short stature, abdominal pain, abdominal distension, bloating, and chronic diarrhea (El-Metwally et al., 2020).

CD diagnosis can be challenging due to its wide array of symptoms and manifestations, some of which are non-specific or extend beyond the gastrointestinal domain. Certain individuals may remain asymptomatic or experience only mild symptoms. Additionally, CD symptoms can overlap with those of other conditions, such as irritable bowel syndrome, lactose intolerance, or food allergies (Makharia et al., 2015). Moreover, manifestations of CD may affect various organs or systems, including the skin, bones, nerves, or the central nervous system (Nikpour, 2012). As a result, the diagnosis of CD typically necessitates a combination of blood tests to detect specific antibodies and an intestinal biopsy for confirmation (Kowalski et al., 2017). Generally, factors associated with an increased risk of CD applies to both genders of any age or racial background, those having a biological relative with CD, individuals possessing HLA-DQ2 and HLA-DQ8 genes, those affected by certain autoimmune diseases, or those experiencing symptoms typically associated with CD (El-Metwally et al., 2020).

2.1. Celiac disease and food allergies

CD is not characterized as a food allergy or intolerance (Figure 1); rather, it is an autoimmune disorder primarily affecting the small intestine and requires a lifelong gluten-free diet (GFD). People with CD may also have other food allergies or intolerances, such as lactose intolerance (a difficulty digesting milk sugar) or fructose malabsorption (a difficulty absorbing fruit sugar). These conditions may cause similar symptoms as CD but have different causes and treatments (Guandalini and Newland, 2011).

Contrary to CD, food allergies are immune-mediated reactions to specific food components, usually proteins or sugars. Food allergies can induce various symptoms, such as skin rashes, breathing difficulties, nausea, vomiting, or anaphylaxis (a severe and potentially fatal reaction that affects the respiratory and circulatory systems (Seth et al., 2020). Food allergies can be detected by skin tests, blood tests, or oral food challenges, and the treatment is to avoid the allergenic foods and in certain cases, carry an epinephrine auto-injector for emergency use (Harvard Health, 2023). Some common food allergies that affected 0.2-0.5%, 1-2% and 0.5-1% are wheat allergy, peanut allergy, and milk allergy, respectively (Sicherer and Sampson, 2018; Gupta et al., 2018; Rona et al., 2007).

Wheat allergy, in particular, is an immune response directed at proteins present in wheat, which can cause symptoms like itching, swelling, hives, asthma, or anaphylaxis. This is not the same as CD or non-celiac gluten sensitivity (NCGS), which are responses to gluten. People with a wheat allergy need to avoid wheat and wheat-containing products, but they may be able to eat other gluten-containing grains, such as barley and rye (Sicherer and Sampson, 2018).

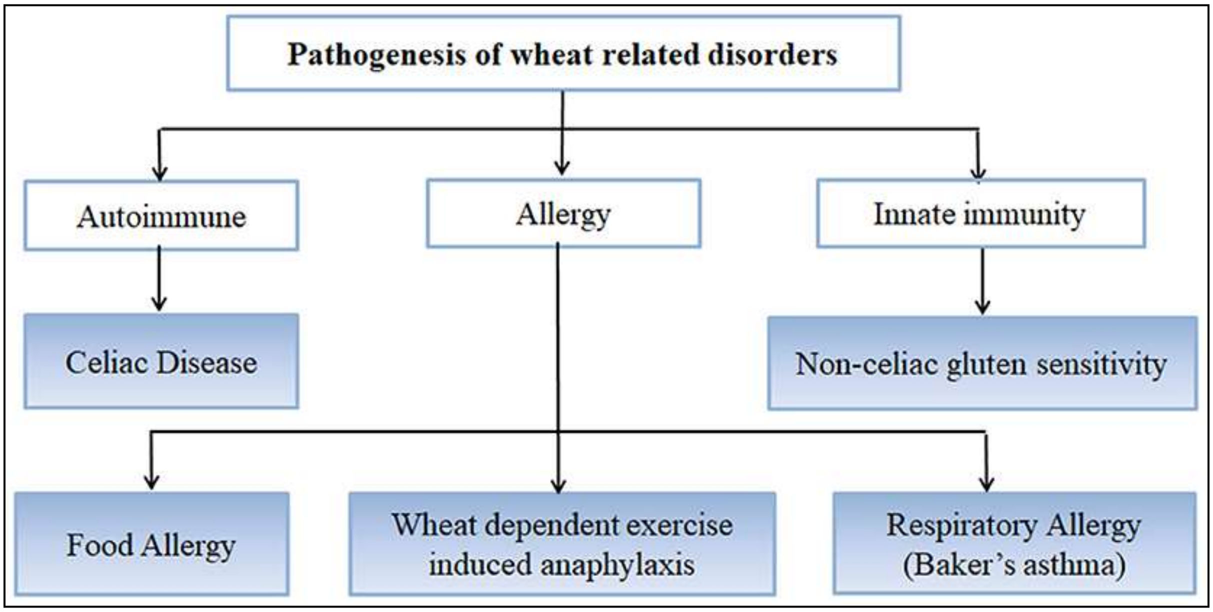

Figure 1: Immune reactions involved in wheat related disorders by Sharma et al. (2020).

2.2. Prevalence of celiac disease

The global prevalence of CD is estimated to be 1.4% based on serological tests and 0.7% based on biopsy results; that said, approximately half of the cases are undiagnosed or misdiagnosed (Lebwohl et al., 2018). In the United States, CD affects about 2 million people (or 1% of the population), according to the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), a part of the National Institutes of Health (NIH). CD can affect individuals of all age groups, from children to older adults. However, it is often diagnosed more frequently in children and adolescents (Collin et al., 2018). This is because symptoms often appear in childhood when gluten-containing foods are introduced into the diet.

In Saudi Arabia, CD has also garnered attention, with some studies suggesting that it is not uncommon in the region. The prevalence of biopsy-proven CD is estimated at 1.4%, and the seroprevalence stands at 2.7% in normal population, underscoring the significance of the condition in this geographical context (Safi, 2018).

2.3. Treatment

The only effective treatment for CD is a lifelong strict GFD diet, which can restore intestinal mucosal integrity and improve symptoms and complications (Aljada et al., 2021). Notably, a gluten-free regimen, while is indispensable, presents significant challenges and financial implications, necessitating the complete avoidance of all foods that either inherently contain gluten or have been subject to contamination with gluten. Gluten can also be present in hidden sources, such as modified food starch, preservatives, cosmetics and toothpaste (Harvard Health, 2023). Therefore, it is essential for those affected by CD to check the labels of foods, medicines, and other products for gluten content or cross-contamination.

In order to navigate the complexities of a healthy GFD, individuals afflicted with CD can seek guidance and support from registered dietitians. These professionals possess the expertise required to devise dietary plans that not only cater to the constraints of gluten avoidance but also promote overall well-being. Additionally, it is essential to recognize that CD may give rise to nutritional deficiencies, necessitating the consideration of vitamin and mineral supplementation to rectify these deficits (García-Manzanares and Lucendo, 2011).

2.4. Psychological effects gluten-free diet

CD has various impacts on the health and well-being of patients, beyond the biological parameters of intestinal damage and malabsorption. CD also involves social and psychological issues that need to be addressed, such as mood disorders, quality of life (QoL), and adherence to treatment (Ogundele, 2018; Zendjidjian et al., 2012). There have been many studies conducted on CD and the psychological effects on patients, such as depression, anxiety, irritability, ADHD, eating disorders, and social anxiety (Zendjidjian et al., 2012; Fera et al., 2003).

These psychological issues can result from different factors, such as an inflammatory response to gluten affecting the brain and nervous system, causing mood changes, cognitive impairment, headaches, and neurological disorders. Also, malabsorption of nutrients can cause fatigue, anaemia, and vitamin deficiencies, which can also impair brain function and mental health (García-Manzanares and Lucendo, 2011). Furthermore, the social and emotional impact of living with CD can be challenging, as it may involve coping with stigma, isolation, discrimination, lack of support, and reduced QoL (Zendjidjian et al., 2012; Fera et al., 2003).

Those with CD may feel isolated or excluded from social situations that involve food, such as gatherings, dining out, or travel. Moreover, they may face stigma or discrimination from others who do not understand their condition or diet. They may also experience anxiety or depression due to the stress of managing their condition or coping with their symptoms or complications (Zendjidjian et al., 2012; Fera et al., 2003). Understanding the interplay of these factors is crucial for healthcare providers and researchers aiming to address the holistic well-being of individuals with CD.

CD also has psychological effects on mothers of children diagnosed with CD. A study aimed to assess the anxiety, depression, and parenting attitudes of mothers with children who have celiac disease, in comparison to mothers of healthy children. The results indicated that mothers of children with celiac disease had significantly higher scores in depression and state-trait anxiety compared to mothers of healthy children. Additionally, these mothers exhibited higher scores in parenting attitudes characterized by overparenting, authoritarian attitudes, and attitudes of hostility and rejection (Doğan et al., 2020). This suggests that having a child with celiac disease may have a substantial impact on the psychological well-being and parenting attitudes of mothers.

2.5. Aims

CD can exert a profound impact, not only on an individual's physical health, but also on their mental and emotional well-being. This can also be said for the mental wellbeing of those who provide care for people with this condition. The literature regarding the association between adherence to a GFD and the well-being of mothers in the context of children with CD is relatively extensive. However, a noteworthy gap exists within this body of research. Thus, while there is a substantial focus on the physical aspects of CD management, including dietary adherence and its impact on clinical outcomes, there is comparatively limited exploration of the intricate interplay between GFD adherence, maternal QoL, and maternal stress levels. Existing research primarily centres on the medical aspects of CD management, leaving a substantial gap in comprehending the psychosocial dimensions of this condition for mothers. Understanding how GFD influences the holistic well-being of mothers is crucial, as it can provide valuable insights into potential avenues for comprehensive support and intervention. This review aims to bridge this gap by examining the relationship between the adherence to a GFD and its potential effects on the QoL and levels of stress experienced by mothers responsible for caring for children diagnosed with CD.

3. Children

Several studies have investigated the association between CD and psychiatric disorders including mood disorders, anxiety disorders, eating disorders, attention deficit hyperactivity disorder (ADHD), and autism spectrum disorder (Coburn et al., 2020; Lebwohl et al., 2021; Jackson et al., 2012); the effects of a GFD on brain function and the impact on the QoL and psychological well-being of children with CD (Samasca et al., 2014; Skjerning et al., 2014) . In light of these findings, it is evident that the management of CD extends beyond dietary considerations, encompassing the complex interplay of physical, mental, and emotional well-being.

3.1. Depression and anxiety among children diagnosed with celiac disease and impact of gluten-free diet on their quality of life.

Several studies have shed light on the complex interplay between CD and its profound effects on depression and anxiety among children diagnosed with CD and how adherence to the GFD improved QoL of those children. For instance, a study aimed to assess psychiatric disorders and health-related QoL in children with celiac disease (CD) and analyze potential contributing factors. The research included 52 children diagnosed with CD and 40 healthy children. It found that children with CD had lower QoL scores, and 50% of them exhibited at least one psychiatric disorder, emphasizing the association between CD, psychiatric symptoms, and reduced QoL (Sevinç et al., 2017).

In contrast, another study found that depression scores did not significantly differ between CD patients and healthy controls, they reported that children with CD had lower overall QoL scores. However, the study reported that adherence to a GFD was associated with reduced depression symptoms, highlighting the potential for improving both QoL and mental health in pediatric CD patients through dietary adherence (Simsek et al., 2015). Likewise, a prospective study assessed the impact of a GFD on the QoL of 40 children with screen-detected CD. Children with symptom-detected CD initially had poorer QoL and more gastrointestinal symptoms. However, after one year of following the GFD, both groups experienced significant improvements in QoL and gastrointestinal symptoms, highlighting the positive effects of a GFD on well-being for celiac patients, alleviating concerns about its burden (Mustalahti et al., 2002). These studies collectively underscore that CD not only impacts physical health but also significantly affects the mental and emotional well-being of those affected by the condition or involved in its care.

While adherence to a GFD is a cornerstone of CD management, it is essential to consider the potential challenges and risks associated with this dietary approach. Esenyel and Ünal (2014) found no significant differences in depression and anxiety levels between pediatric celiac patients adhering to a gluten-free diet and a healthy control group. Although, the parents of the patients in the gluten-free diet non- compliant group have higher anxiety levels than the parents of the patients in the compliant group. This could be a result of strict adherence to a GFD which may not always equate to an improved QoL, particularly when social and emotional factors are taken into account. Patients adhering to a GFD may experience stress related to dining out, feelings of embarrassment, and frustration when their diet is perceived as trendy.

3.2. Factors contributing to elevated depression and anxiety levels and a poor quality of life among of children with celiac disease.

The psychological effects of CD are multifaceted and stem from various sources, including gluten-induced inflammation, nutritional deficiencies, the demands of adhering to a GFD, and the social and emotional challenges associated with the condition. Firstly, the inflammation induced by gluten consumption can extend its effects beyond the gastrointestinal system, affecting the brain and nervous system. This inflammation has been associated with mood changes, cognitive impairment, headaches, and the development of various neurological disorders (Jackson et al., 2012).

Secondly, the malabsorption of essential nutrients in individuals with CD can lead to significant physical health issues, including fatigue, anemia, and vitamin deficiencies. Importantly, these nutritional deficits can also impair brain function and mental health, further exacerbating the psychological burden experienced by those with CD (Verma, 2021).

Moreover, the diagnosis and treatment of CD introduce a unique form of stress. Managing the condition necessitates a lifelong commitment to a strict GFD and constant vigilance to identify and avoid hidden sources of gluten in foods, medications, and other products. This ongoing regimen and the associated lifestyle adjustments can contribute to heightened stress levels (Simón et al., 2023).

Lastly, the social and emotional impact of living with CD adds another layer of complexity to the psychological effects of the condition. Individuals with CD may face coping challenges related to stigma, social isolation, discrimination, and a lack of support. These factors, combined with the dietary restrictions and ongoing health concerns, can result in a reduced QoL and emotional distress (Czaja-Bulsa and Bulsa, 2018).

3.3. Strategies to assist children with CD in lowering their depression and anxiety levels and enhancing their quality of life.

Children with CD face many challenges in adhering to a strict GFD, which is the only available treatment for their condition. Therefore, it is important to find solutions to reduce these challenges and improve the health outcomes of children with CD. In order to address these challenges and proposes potential solutions tailored to different age groups.

Educational initiatives targeting mothers can be effective for preschool children, who predominantly interact with their mothers and are often at home,. This education should encompass strategies for managing their children's emotions and feeling, emphasizing the importance of a gluten-free diet (GFD), and ensuring a well-balanced GFD, with recourse to professional guidance when necessary (Case, 2005; Elsahoryi et al., 2020).

For school-aged children, a comprehensive approach involves educating and counseling the children themselves. This education should cover the advantages and potential risks associated with a GFD, sources of gluten as well as gluten-free alternatives (Celiac Disease Foundation, 2020, (Meyer, 2022).

In the case of adolescents, equipping them with essential skills such as interpreting food labels, food preparation, effective coping strategies, and emotional regulation skills is crucial. Furthermore, connecting them with available resources and support groups can significantly enhance their ability to manage their condition effectively (Bongiovanni et al., 2010; Skjerning et al., 2014).

Healthcare providers also play a vital role in addressing the social and emotional aspects of dietary adherence when advising patients on GFDs, thereby promoting a more holistic approach to CD management (Case, 2005; Simón et al., 2023).

4. Mothers

Mothers of children with CD often play a central role in managing their child's dietary needs (Russo et al., 2020). However, similar to the challenges facing children with CD, this role can also be challenging and stressful due to various factors associated with GFD. Even though an extensive scientific literature regarding the effects of diagnosis and treatment of CD on the QoL of children and adolescents, there is limited research available on the outcomes experienced by parents or caregivers as a result of CD treatment. QoL is defined by the WHO as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". It's a comprehensive idea that intricately intertwines an individual's physical well-being, mental state, degree of self-sufficiency, social connections, personal convictions, and their interactions with significant aspects of their surroundings.

4.1. Impact of adhering to gluten-free diet stress level and quality of life of mothers of children with celiac disease.

Even though studies have reached a consensus that mothers of children diagnosed with celiac disease experience an elevated level of stress (Epifanio et al., 2013; Doğan et al., 2020), studies examining the relationship between an adherence to a GFD and the QoL in mothers of children with CD have yielded mixed results. The mixed results may be attributed to factors such as variations in the severity of the disease among children, the level of adherence to the GFD by children and their families, the availability and affordability of GFPs, and differences in study design, sample size, and methodology, which can lead to variations in the results.

On one hand, some investigations have indicated that an adherence to a GFD can have an adverse impact on maternal QoL and elevate stress levels (Abreu Paiva et al., 2019; Esenyel and Ünal, 2014; Russo et al., 2020). Interestingly, in one study when evaluating the perspectives of both children and their parents, parents typically rate their children's QoL as poorer than the children themselves do (Barrio and Cilleruelo, 2022). These studies have attributed a negative impact of GFD on QoL and stress cite factors such as social isolation, difficulty in finding GFPs, the high cost of GFPs, and lack of support from health professionals (which will discussed in detail in 4.2) (Bacigalupe and Plocha, 2015; Leffler et al., 2008). Nonetheless, mothers who do not adhere to a GFD might encounter elevated levels of depression and anxiety (Yavuz et al., 2022).

On the other hand, other studies have reported a positive effect of GFD adherence on maternal QoL and stress reduction (Suzer Gamli and Keceli Basaran, 2022; Casellas et al., 2015). A study by Al Furaikh et al. (2021) assessed the QoL of families with children diagnosed with CD undergoing GFD treatment in Saudi Arabia. The findings revealed that the majority of parents perceived their QOL as moderate, with only a small percentage considering it good. Factors such as family size, maternal age, and education level influenced QOL, and emotional and psychosocial aspects of QOL were notably impacted by the challenges related to the availability of GFD in daily life. Generally, studies have suggested that GFD can have a positive effect on QoL and stress by improving the health and well-being of the child, enhancing the family cohesion, and increasing the knowledge and awareness of CD.

4.2. Factors contributing to elevated stress levels and a poor quality of life among mothers of children with celiac disease.

The relationship between GFD and the QoL and stress experienced by mothers of children with CD is intricate, influenced by various factors as previously discussed. Nevertheless, there is no comprehensive exploration of these reasons in existing studies, with the factors highlighted in this review being briefly mentioned in the available literature (Abreu Paiva et al., 2019; Esenyel and Ünal, 2014; Russo et al., 2020; Leffler et al., 2008; Bacigalupe and Plocha, 2015). These factors are discussed below with explanation.

Firstly, mothers caring for children with CD often grapple with social isolation as a result of their child's dietary restrictions. For instance, mothers may refrain from participating in social gatherings, dining out at restaurants, or arranging playdates as a means of safeguarding their child from accidental gluten exposure. This deliberate avoidance can result in mothers feeling lonely and socially isolated, subsequently contributing to heightened stress levels. Besides, isolation can diminish mothers' support networks, as they may feel misunderstood or unsupported by friends and family who do not fully grasp the challenges of a GFD.

Secondly, mothers frequently encounter challenges in procuring gluten-free products for their children. These challenges encompass limited availability of gluten-free items in the market, high costs associated with specialized products, and concerns regarding the reliability and safety of such products. Mothers may struggle to afford these specialized foods, which can lead to stress about their ability to provide for their child's dietary needs. Besides, in some areas, gluten-free products may be less accessible, requiring extra effort in terms of travel, time, and resources to source them. These difficulties can escalate stress levels, particularly in relation to meal planning and grocery shopping and it is particularly stressful for mothers with limited resources.

There have also been a number of studies in which mothers have reported inadequate support and information from healthcare professionals when it comes to managing a GFD and alternative products and recipes for their children with CD. Inadequate or outdated information from healthcare providers about CD and the GFD can lead to stress and confusion. Mothers may feel left to navigate this complex dietary regimen without sufficient guidance. Additionally, mothers may not receive the emotional support they need from healthcare professionals to cope with the challenges of managing CD. This lack of emotional support can amplify feelings of stress and isolation. Moreover, coordinating care with various healthcare providers, including dietitians and specialists, can be complex and time-consuming. A lack of coordination or accessibility can create additional stress.

In addition, anxiety surrounding cross-contamination of gluten, whether within their own kitchens or when dining out, is a prevalent source of stress for mothers. This fear necessitates heightened vigilance in ensuring a safe gluten-free environment for their children and themselves.

Recognising and comprehensively addressing these factors is crucial for healthcare providers and researchers, as it paves the way for the development of targeted interventions, educational resources, and adequate support systems that can assist mothers in effectively managing the dietary needs of their children with CD. Ultimately, these initiatives have the potential to improve the QoL for both mothers and their children living with this condition.

4.3. Strategies to assist mothers of children with CD in lowering their stress levels and enhancing their quality of life.

While there is limited literature on the influence of CD and GFD adherence on stress and QoL among mothers (Satherley et al., 2020), the existing literature offers a spectrum of effective strategies to address the challenges mothers of children with CD face. Implementing these strategies can enhance their mental and emotional well-being.

Firstly, education and counselling. A significant pillar of support for mothers lies in comprehensive education concerning CD and the effective management of GFD. Empirical evidence substantiates the efficacy of educational initiatives in stress reduction, while concurrently boosting mothers' confidence in competently managing their child's dietary requirements (Lee et al., 2021). Education equips mothers with a thorough understanding of CD, including its causes, symptoms, complications, and the critical role of dietary management. Mothers can also learn how to implement a gluten-free diet effectively, including reading food labels, identifying sources of gluten, and meal planning. Besides, education empowers mothers to prevent accidental gluten exposure, which is essential in managing CD. Furthermore, with proper education, mothers gain confidence in managing their child's CD. Knowing what to do and how to do it reduces the anxiety associated with dietary management. In conjunction with education, counselling services provide vital emotional support and equip mothers with indispensable coping mechanisms to address the challenges associated with CD.

Secondly, the establishment and nurturing of support networks, both in local and online communities, emerge as a valuable resource for mothers (Garcia, 2023). These networks furnish a sense of belonging, enabling mothers to forge connections with individuals sharing similar experiences. Within these networks, mothers avail themselves of the opportunity to exchange crucial information, dispense practical tips, and seek emotional solace. Such a communal support system plays an instrumental role in alleviating stress and mitigating feelings of isolation. Another strategy in relieving stress is the provision of reliable dietary guidance and resources (Elsahoryi et al., 2020). This entails equipping mothers with knowledge pertaining to safe gluten-free food options, adept cooking techniques, and effective meal planning serves to augment their capacity to provide suitable foods. This guidance also alleviates concerns related to food sourcing and preparation.

Furthermore, to effectively tackle the issues of cross-contamination and anxiety linked to gluten in the lives of mothers caring for children with CD, a comprehensive approach encompassing both practical strategies and emotional support is essential. This includes methods such as planning meals ahead to guarantee the availability and safety of gluten-free options, utilizing gluten-free recipes and ingredients for meal preparation, and instructing mothers and caregivers on the meticulous reading of food labels to uncover concealed sources of gluten.

Additionally, healthcare providers play a crucial role in supporting mothers and caregivers in managing the dietary needs of children with CD. Their guidance is instrumental in ensuring the child's health and the well-being of the caregivers. As an example, physicians responsible for diagnosing CD in children and educating parents and caregivers about the condition, including the importance of a strict gluten-free diet. Psychologists and mental health professionals have the capacity to evaluate the emotional and psychological impact of CD on mothers, identifying issues related to anxiety, depression, and stress. Simultaneously, social workers can assess the social and familial aspects of the mother's situation, taking into account factors like family support, financial challenges, and social isolation. In addition, dietitians can offer comprehensive education on the gluten-free diet, meal planning, and nutritional requirements, which helps reduce stress related to dietary concerns. Therefore, collaborative healthcare, which involves a multidisciplinary team of professionals such as paediatricians, dietitians, and psychologists, assumes paramount importance in the pursuit of stress reduction for mothers overseeing children with CD (da Conceição et al., 2020). The counsel, information, and reassurance extended by healthcare providers contribute to the development of a comprehensive approach to CD management. This collaborative care approach, ensuring that mothers receive the well-rounded support they require, significantly diminishes stress levels. The implementation of these strategies, coupled with continued research to gauge their effectiveness, stands as an imperative undertaking in safeguarding the well-being of mothers caring for children with CD.

5. Conclusion

CD is a complex autoimmune disorder that affects individuals both physically and emotionally. The impact of CD extends beyond the gastrointestinal symptoms it presents, affecting various aspects of life, including mental and emotional well-being. CD diagnosis and management involve adherence to a strict GFD, which can be challenging due to numerous factors, such as social isolation and difficulty in finding GFPs. These challenges can lead to increased stress levels and have a significant impact on the QoL of both children with CD and their mothers, who play a central role in managing their dietary needs. Research on the relationship between GFD adherence, stress and QoL in mothers of children with CD has garnered mixed results. While some studies have indicated negative effects on maternal QoL and increased stress levels, others have shown positive outcomes related to improved health and family cohesion. These mixed findings highlight the complexity of the issue and the need for a comprehensive approach to addressing the challenges faced by mothers in managing CD. To mitigate the challenges and improve the well-being of both children and mothers affected by CD, several solutions have been proposed. These solutions include comprehensive education and counselling, the establishment of support networks, providing reliable dietary guidance and resources, and fostering collaborative healthcare involving a multidisciplinary team of professionals. These strategies aim to reduce stress, enhance the QoL, and ultimately provide holistic support for mothers dealing with children with CD.

6. Recommendations

As we look to the future of celiac disease (CD) research, several critical areas demand further investigation to advance our comprehension of this condition and enhance patient care. These recommendations stem from the identified gaps and challenges in existing literature. They encompass the necessity to conduct research that delves into understanding the challenges experienced by individuals with CD, assessing the effectiveness of educational interventions and support programs in promoting adherence to gluten-free diets, exploring the pivotal roles of mothers and caregivers in managing such diets for children with CD, and developing strategies to support them. Moreover, the exploration of initiatives aimed at enhancing the accessibility and affordability of gluten-free products, particularly in regions with limited access, is imperative. Additionally, the development and implementation of training programs for healthcare providers to bolster their capacity to effectively diagnose and manage CD is of paramount importance. By addressing these research areas, Saudi Arabia can make a substantial contribution to the global understanding of CD and improve the care and quality of life of individuals affected by this condition within the country, with the potential for broader implications for CD management worldwide

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