

Knowledge and Attitude towards Celiac Disease Signs, Symptoms, and Treatment in Tikrit City

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Abstract

Background: Coeliac disease constitutes a considerable public health concern, however awareness and comprehension of the condition differ significantly. This research aimed to assess the understanding and perspective of coeliac disease among the inhabitants of Tikrit city. **Methods:** A cross-sectional study involving 195 participants was done, stratified by gender, age, educational attainment, work position, and personal or familial history of coeliac disease. Data were gathered on participants' understanding of coeliac disease, encompassing its definition, detrimental ingredients, diagnostic procedures, symptoms, and treatment options. Attitudes regarding the importance of gluten-free options in public spaces and the requirement for educational initiatives were evaluated. **Results:** The study population was primarily composed of males (83%) and individuals aged 18-25 (48%). A plurality possessed a bachelor's degree (57%). Understanding of coeliac disease was inconsistent, with 52.8% accurately characterising the condition and 64.6% recognising detrimental elements. Approximately 69.1% were aware of the appropriate diagnostic procedure, while 62.6% identified prevalent symptoms. Knowledge levels were markedly elevated among females and fluctuated according to educational background and age group, although exhibited no significant variation based on employment position or personal/family medical history. Approximately 80% of participants recognised the significance of providing gluten-free alternatives, while 90.8% saw a necessity for enhanced community educational initiatives. **Conclusion:** The study indicates a deficient level of awareness regarding coeliac disease in Tikrit city, with significant variation based on gender, age, and educational attainment. The favourable perspective on gluten-free alternatives and educational initiatives highlights a community's commitment to improving the understanding, management, and treatment of coeliac disease. These data underscore the need for specialised educational initiatives to bridge knowledge gaps and enhance public health in this region.

Keywords: Celiac Disease, Knowledge, Gluten Sensitivity.

INTRODUCTION

Coeliac sprue, or disease (CD), is characterised as a persistent immune-mediated response triggered by gluten consumption in genetically susceptible individuals. The management and treatment of Coeliac disease typically need rigorous adherence to a gluten-free diet (GFD). Comprehending the concept and viewpoint on Coeliac disease is essential for effective illness management and compliance with dietary restrictions.^[1] The incidence of misdiagnosed coeliac disease may be challenging to determine if a substantial segment of the population is abstaining from gluten during the diagnostic procedure.^[2] The prevalence in Arab communities differs by gender and age, with a higher incidence in Saudi Arabia and a lower incidence in Tunisia, and females demonstrating a greater frequency than males.^[3] Approximately 12%

of those diagnosed with irritable bowel syndrome (IBS) were found to have Coeliac disease.

In the research by Al-Suhaimat *et al.*^[4], community chemists shown differing degrees of awareness and understanding of Coeliac disease. A moderate correlation exists between chemists' expertise, knowledge, and participation in continuous learning programs and primary opinion and patient approval. The overview and behaviour of chemists concerning Coeliac illness reveal a minimal correlation, underscoring the need for improved education and training to bolster their participation in the early diagnosis and health promotion of Coeliac disease.^[5]

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Dietary compliance is a crucial aspect of managing Coeliac disease. Research by Paganizza *et al.*^[6] revealed a substantial link between awareness of Coeliac disease and a gluten-free diet (GFD) and adherence to the diet among adult patients with Coeliac disease.^[7] Paganizza *et al.*^[6] assessed physicians' knowledge, practices, and attitudes about Coeliac disease screening and discovered a deficiency in knowledge among physicians, with no significant distinction between paediatric and general care practitioners.^[8] Jinga *et al.*^[9] identified a deficiency in physicians' comprehension of essential features and diagnostic criteria for Coeliac disease in adult patients, highlighting the necessity to improve knowledge among physicians in different disciplines.^[10]

Research by Dimidi *et al.*^[11] shown that adherence to a gluten-sensitive diet (GSD) in Coeliac disease is influenced by various factors, including gender, emotional well-being, participation in support groups, and perceptions of the chronicity of the condition.^[12]

Goals and Objectives

Aim

The principal objective of this study is to assess the knowledge, treatment, and attitudes of coeliac disease among the inhabitants of Tikrit city.

Objectives

1. To evaluate the degree of pieces of information concerning Celiac Disease.
2. To analyze the knowledge variation across different demographics about Celiac Disease.
3. To evaluate attitudes towards Celiac Disease.
4. To identify knowledge gaps and educational needs about Celiac Disease.

LITERATURE REVIEW

Celiac Disease

Coeliac disease is a disorder impacting the small intestine, triggered by an adverse reaction to gluten in the diets of genetically predisposed individuals. It is a chronic illness, and the fundamental conventional treatment is the permanent elimination of gluten from the diet.^[1] Individuals with coeliac disease may exhibit symptoms including diarrhoea and failure to thrive, although others may remain asymptomatic entirely.

Etiology

The symptoms of Coeliac disease arise from damage to the enterocytes, which are the cells that line the small intestine. In severe cases, persistent inflammation and atrophy of the small intestine's villi are characteristic hallmarks of the illness.^[1]

Coeliac disease necessitates the presence of predominant HLA genes DQ2 or DQ8. It arises from the immune system's adverse response to gluten, with tissue transglutaminase antibodies playing a significant role. Although several mechanisms are proposed to play a role in the condition, gliadin, a glycoprotein found in gluten, can directly damage

enterocytes by elevating IL-15 production.^[2]

Some studies indicate that gastrointestinal infections in early childhood may contribute to the subsequent onset of coeliac disease. This relationship is comprehensible because to the participation of the damaged organ, the immune system, which underpins the disorder's progression.^[3]

To facilitate early detection of coeliac disease, the measurement of IgA antibodies is essential, specifically targeting smooth muscle endomysium and tissue transglutaminase. It is noteworthy that merely approximately 5% of individuals with coeliac disease demonstrate a deficiency in immunoglobulin levels.^[13]

Epidemiology

The prevalence of Coeliac disease in the general population ranges from 0.5% to 1%. Over the past two decades, the actual prevalence, identification, and detection of coeliac disease have increased. Its prevalence is elevated in patients with immune-mediated disorders, such as type 1 diabetes mellitus. The risk for first-degree relatives of persons with Coeliac disease is 1 in 10.^[1]

Pathophysiology

A notable observation is that the pathogenesis of CD results from a complicated interplay of genetic and environmental factors. Exposure to gluten, in conjunction with a genetic predisposition, may provoke an intrinsic pro-inflammatory response in the gut, accompanied by an erroneous adaptive counterreaction resulting from insufficient gluten compliance. A significant genetic propensity correlates with the existence of human leukocyte antigen (HLA) risk alleles. The consumption of gluten is crucial for the advancement of coeliac disease. The duration of nursing and the timing of gluten introduction do not affect the associated risk. Gluten intolerance may be triggered by various reasons, including gastrointestinal disorders, medications, alpha-interferon, and surgical procedures, at any stage of an individual's life.^[1-3]

A component of gluten found in wheat, rye, and barley, known as gliadin, damages the small intestine by inducing localised inflammation and eradicating the villi, which are diminutive, finger-like projections. This damage diminishes the intestine's capacity to absorb nutrients, resulting in malabsorption. This affects not just the digestive system but also general health, resulting in symptoms throughout numerous bodily systems, not solely the gastrointestinal system, in patients with coeliac disease.^[13]

Coeliac disease especially alters the mucosa of the small intestine. Characteristics encompass the lack or atrophy of villi, along with crypt hyperplasia, as illustrated in Figure 1. Moreover, there is an augmented presence of lymphocytes and plasma cells in the lamina propria, the connective tissue layer beneath the intestinal epithelium.^[5] Historical ambiguity exists concerning the safety of bran for persons with Coeliac disease. Recent study indicates that bran itself is not dangerous. The prior ambiguity arose from the prevalent practice of processing oats with wheat, resulting in significant cross-contamination levels.^[2]

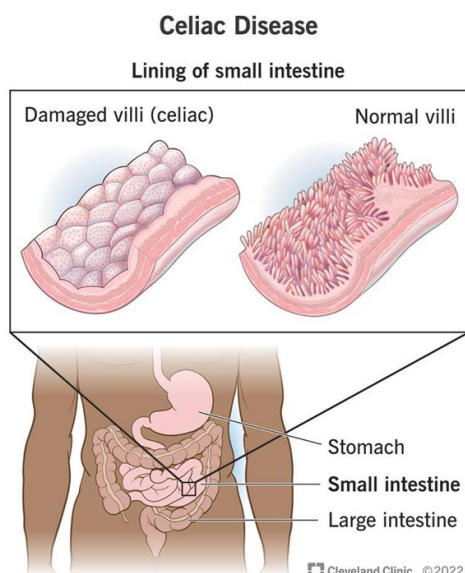


Figure 1: Celiac Disease Intestinal Villi Damage.^[1]

Clinical Features

Clinical manifestations may encompass both intestinal

and extraintestinal complaints. Diarrhoea, dyspepsia, bloating, and stomach discomfort constitute several intestinal symptoms. Extraintestinal manifestations encompass weight reduction, iron deficient anaemia, microcytic or megaloblastic anaemia, and osteopenia.^[2] Coeliac Disease, marked by symptoms including lethargy, diarrhoea, abdominal pain, and vomiting, also manifests with complications such as failure to thrive in children and unexplained weight loss in adulthood. Additional manifestations comprise oral ulcers, anaemia, ataxia, persistent headaches, and delayed menstruation. Untreated mothers may experience complications such as preterm labour and stillbirth. Dermatitis herpetiformis, a dermatological disorder associated with gluten intolerance, generally ameliorates with a gluten-free diet. Extraintestinal symptoms include anaemia, coagulation disorders, osteoporosis, and neurological complications such as muscle weakness, paraesthesia, seizures, and ataxia resulting from vitamin deficiencies, as seen in Figure 2.^[2]

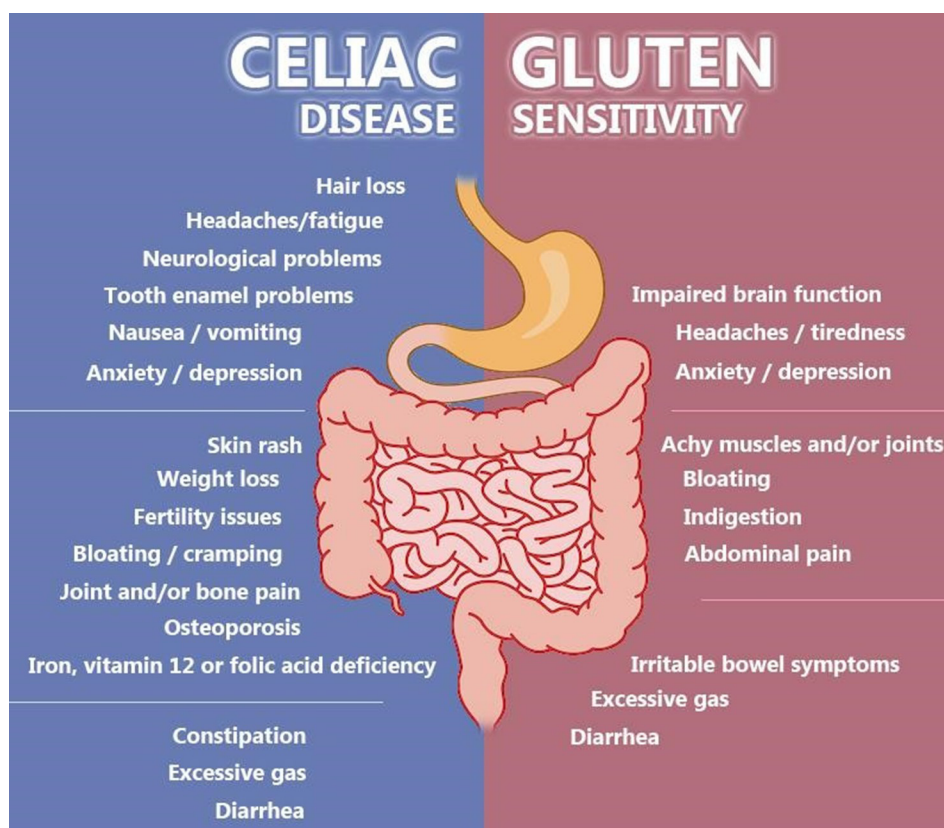


Figure 2: Signs and Symptoms of Celiac Disease.^[2]

Diagnosis

The diagnostic procedure often commences with serological assays that evaluate two antibodies: anti-tissue transglutaminase antibodies (quantified using ELISA) and anti-endomysial antibodies (classified as negative, mildly positive, or positive). A duodenal mucosal biopsy

has traditionally been the gold standard for detecting and displaying the villous atrophy characteristic of coeliac disease.

It is essential that these tests be performed while the afflicted individual ingests a standard gluten-containing diet for accurate findings.^[3]

HLA testing serves as an essential instrument in the diagnostic evaluation of coeliac disease. Specific HLA genotypes are strongly associated with the illness. The 2013 guidelines from BSPGHAN and Coeliac UK indicate that positive serological tests, along with positive HLA typing and characteristic symptoms, may be adequate for diagnosis without necessitating a biopsy.^[13]

Laboratory assessments for persons with type 1 diabetes mellitus and Down syndrome, who possess an increased risk of coeliac disease, require meticulous investigation. Electrolyte values may suggest hypocalcaemia, hypokalaemia, or metabolic acidosis. Anaemia may arise from deficits in folate, iron, or vitamin B12, and prothrombin time may be prolonged. Stool examination may indicate a greasy texture and a foul smell.

Management

Individuals diagnosed with coeliac disease must rigorously follow a gluten-free diet, preferably under the supervision of specialists such as dietitians. Following the initiation of the diet, symptoms generally ameliorate within a span of days to weeks. If symptoms continue despite compliance, a reevaluation of the diagnosis and agreement of the nutritional therapy is required. Serological testing can evaluate adherence, as noncompliance may occur unintentionally due to accidental gluten consumption.^[3] Further examinations to evaluate the effects of food malabsorption resulting from coeliac disease encompass monitoring:^[13]

Full blood count

Iron stores

Folic acid levels

Ferritin levels

Levels of vitamin D and other fat-soluble vitamins

Bone mineral density

Managing individuals with definitive serology but without atypical findings on duodenal testing can be contentious, as there are instances where the diagnosis remains ambiguous. Certain people may exhibit symptoms despite the absence of discernible alterations in the biopsy. Moreover, there exists a condition known as seronegative coeliac disease, when patients display characteristic symptoms in the absence of serological confirmation, yet significant villous atrophy is seen upon duodenal examination.^[3]

Gluten-free nutrients are the sole treatment for coeliac disease, profoundly affecting the lives of those affected and presenting obstacles for management. Current study seeks to establish non-dietary interventions to facilitate gluten tolerance in individuals with coeliac disease. Immune modulators are the primary focus, however other strategies, including immunisations and agents modifying gluten toxicity, are also being investigated. Nonetheless, no one is current with the procedures for advice or approval of treatment.^[13] A negligible proportion of patients with coeliac disease may exhibit improvement after corticosteroid therapy.^[3]

Patients with precise diagnoses and treatments for coeliac disease typically exhibit a favourable prognosis. Nonetheless, adherence to a gluten-free diet is arduous, and relapse is common. Certain cases do not address a gluten-free diet or corticosteroid use, resulting in an underappreciation of overall well-being.^[5]

Complications

Coeliac disease presents enduring dangers, including lymphomas and small bowel adenocarcinomas, while pregnant women may encounter miscarriage or congenital anomalies in newborns. Children are susceptible to low stature and failure to flourish. Inability to absorb nutrients may lead to osteopenia, bleeding diathesis, impaired development, anaemia, reduced exercise endurance, and seizures. Timely and accurate diagnosis coupled with targeted therapy might mitigate severe consequences and health risks associated with coeliac disease.^[3]

MATERIALS AND METHODS

Study Design

The study was deemed cross-sectional, with data obtained through online and in-person means. The questionnaire was divided into several sections, encompassing demographic data, understanding of coeliac disease, attitudes towards the condition, and management of coeliac disease. The questionnaire has multiple-choice questions designed to assess knowledge, attitudes, and treatment regarding coeliac disease.

Data Collection

The poll was conducted via Google Forms, and we reached out to individuals through a widely available and user-friendly web platform. Data gathering occurred from April 1 to June 1, 2024. The poll link was distributed via social media platforms and email, aimed at the population of Tikrit city. Participation was optional and anonymous, guaranteeing ethical adherence and secrecy.

Knowledge Assessment

The general knowledge of study participants regarding coeliac disease was evaluated by multiple-choice questions covering various facets of the condition. Each question is scored from 0 to 1, resulting in a total score for each participant ranging from 0 to 5. A score of 0 or 1 indicated a deficient level of knowledge, 2 or 3 denoted a moderate level of understanding, while 4 and 5 represented a proficient level of knowledge.

Data Analysis

Data analysis was conducted using SPSS version 27 and Microsoft Excel 2020. Frequencies and percentages were computed for demographic data, knowledge enquiries, and attitude assertions. Chi-square tests were conducted to examine the relationships between demographic changeable variables (including age, sexuality, education, and work status) and awareness levels on coeliac disease. A p-value of less than 0.05 was deemed statistically and numerically significant.

Ethical Considerations

Electronic informed permission was secured prior to participants accessing the survey. The permission form outlined the study's objectives, confidentiality measures, and the voluntary aspect of participation. The study proposal received approval from the Department of Pharmacology and Toxicology at Tikrit University College of Pharmacy to ensure compliance with ethical research standards.

RESULTS

The study comprised 195 individuals, with a predominant male representation (83%, n=161) and a lesser female representation (17%, n=34). The majority of participants were aged 18-25 (48%, n=94), followed by those aged 25-35 (35%, n=69). The most under-represented groups were individuals under 18 years (5%, n=10) and those over 35 years (11%, n=22). A plurality of participants possessed a Bachelor's degree (57%, n=112). Individuals with a high school education represented 17% (n=33), whilst illiterate individuals were the smallest group at 6% (n=12). Students constituted approximately 49% of the participants (n=96). The distribution of the unemployed and employed was relatively equal, at 25% (n=49) and 26% (n=50), respectively. A substantial majority (77%, n=151) claimed no personal or familial history of coeliac disease, whereas 23% (n=44) reported such a history, as illustrated in Table 1.

Table 1: Graphical Statistics of Study Residents (N=195).

Variable		No.	%
Sex	Female	34	17%
	Male	161	83%
Age group	<18	10	5%
	18-25	94	48%
	25-35	69	35%
	>35	22	11%
Education	Uneducated	12	6%
	Primary school	16	8%
	High school	33	17%
	Bachelor's	112	57%
	Higer education	22	11%
	Student	96	49%
Employment status	Unemployed	49	25%
	Employed	50	26%
Personal or family history of celiac disease	No	151	77%
	Yes	44	23%

Approximately 52.8% (n=103) of the individuals accurately identified coeliac disease, whereas 47.2% (n=92) possessed a misapprehension. A majority (64.6%, n=126) accurately recognised substances detrimental to patients with coeliac disease. Approximately 69.1% (n=134) accurately understood the diagnostic process for coeliac disease. 62.6% (n=122) of participants accurately recognised prevalent symptoms of coeliac disease. 64.1% (n=125) were cognisant of the exclusive existing treatment for coeliac disease. Approximately 49.2% (n=96) of the participants exhibited good knowledge, followed by 29.2% (n=57) with intermediate knowledge, and 21.5% (n=42) with weak knowledge, as illustrated in Table 2 and Figure 3.

Table 2: Knowledge of Study Population of Celiac Disease (N=195).

Question	Answer	No.	%
What is celiac disease?	Wrong	92	47.2%
	Correct	103	52.8%
Which ingredients are harmful to people with celiac disease?	Wrong	69	35.4%
	Correct	126	64.6%
How is celiac disease diagnosed?	Wrong	60	30.9%
	Correct	134	69.1%
Which of the following is a common symptom of celiac disease?	Wrong	73	37.4%
	Correct	122	62.6%
What is the only current treatment for celiac disease?	Wrong	70	35.9%
	Correct	125	64.1%
	Good	96	49.2%
Overall knowledge	Moderate	57	29.2%
	Poor	42	21.5%

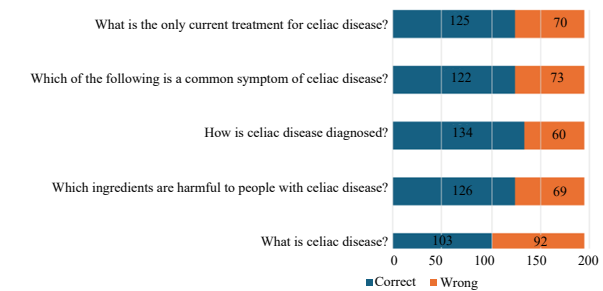


Figure 3: Knowledge of the Study Population of Different Aspects of Celiac Disease.

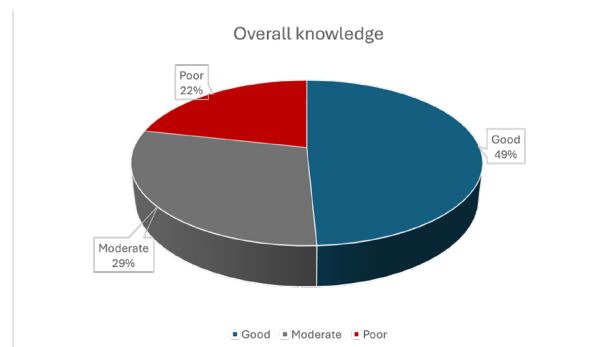


Figure 4: Overall Knowledge of the Study Population of Celiac Disease.

Females had markedly superior levels of knowledge (76.5%) in comparison to males (43.5%). The disparity in scientific achievement between genders was statistically significant ($p < 0.01$). Knowledge levels exhibited considerable variation among age groups, with the highest proficiency recorded in the >35 age group (54.5%) and the lowest in the <18 group (10.0%). This variance was statistically significant ($p < 0.01$). Individuals possessing a Bachelor's degree had the highest percentage of proficient knowledge (61.6%), whereas participants with a high school education demonstrated the lowest (24.2%), as illustrated in Figure 4.

The variation in information science across extensive levels was statistically significant ($p < 0.01$). The students possessed a knowledge level of 51.0%. The disparity in knowledge among various employment positions was not statistically significant ($p > 0.05$). No substantial difference

in knowledge was seen between those with and without a personal or familial history of coeliac disease ($p>0.05$),

as indicated in Table 3.

Table 3: Knowledge According to Different Variables (N=195).

Variable		Overall knowledge			P-values
		Poor	Moderate	Good	
Sex	Female	8.8%	14.7%	76.5%	<0.01**
	Male	24.2%	32.3%	43.5%	
Age group	<18	70.0%	20.0%	10.0%	<0.01**
	18-25	17.0%	28.7%	54.3%	
	25-35	20.3%	33.3%	46.4%	
	>35	22.7%	22.7%	54.5%	
Education	Uneducated	33.3%	25.0%	41.7%	<0.01**
	Primary school	18.8%	56.3%	25.0%	
	High school	51.5%	24.2%	24.2%	
	Bachelor's	11.6%	26.8%	61.6%	
	Higer education	22.7%	31.8%	45.5%	
Employment status	Student	25.0%	24.0%	51.0%	>0.05
	Unemployed	20.4%	42.9%	36.7%	
	Employed	16.0%	26.0%	58.0%	
Personal or family history of celiac disease	No	21.2%	29.1%	49.7%	>0.05
	Yes	22.7%	29.5%	47.7%	

A substantial majority (80%, n=156) considered it essential to provide gluten-free options in public venues. A significant majority (90.8%, n=177) acknowledged the necessity for

enhanced educational initiatives on coeliac disease within the community, as illustrated in Table 4.

Table 4: Attitude Toward Coeliac Disease (N=195).

Question		No.	%
Is it important to offer gluten-free options in public places?	No	39	20.0%
	Yes	156	80.0%
Do you think there is a need for more educational programs about celiac disease in your community?	No	18	9.2%
	Yes	177	90.8%

Discussion

The research revealed that about fifty percent of the participants have an accurate comprehension of Coeliac illness. This aligns with the prevailing global pattern, wherein awareness of coeliac disease remains nascent. A survey by Qasem *et al.*^[3] revealed that in Kuwait, fewer than 15% of respondents recognised coeliac disease, highlighting a widespread lack of understanding in the Middle East. In Saudi Arabia, the majority of the community is well-informed about gluten allergy and peanut hypersensitivity, however fewer than half of the resident population is aware of coeliac disease. The recognition of signs, symptoms, treatment, and diagnostic knowledge in our culture has significantly increased, perhaps due to recent efforts in health education and the effective reach of the media. The recognition of symptoms and understanding of diagnoses in Tikrit City is notably superior to those in certain other areas. A study in Russia indicated gaps in physicians' understanding of coeliac disease diagnosis and treatment approaches, suggesting that medical professionals frequently necessitate additional education on this subject.

The pronounced gender disparity in knowledge, wherein females exhibit superior understanding compared to males, corresponds with overarching trends in health literacy. This may result from heightened health awareness

among women or varying educational experiences. The disparity in knowledge among different age groups and educational backgrounds is unsurprising. Numerous research demonstrate a correlation between higher education and enhanced health awareness. This can also be elucidated by prior research suggesting that women assume a more significant role in family nutrition choices and food preparation.^[8] This study pertains to research from several regions, demonstrating a global benchmark of cognitive disparity based on demographics.^[10] Our findings indicate that those with higher educational attainment and older adults exhibited a better comprehension of coeliac disease. Focussing educational initiatives on certain demographics with inadequate information, such as younger adults and individuals with lower educational attainment, may effectively mitigate knowledge deficiencies within the population of Tikrit city.

We noted strong sentiments regarding the necessity to enhance awareness and assistance for coeliac disease throughout the general public. Over 80% of participants advocated for the provision of gluten-free options in public places, indicating a collective commitment to enhancing inclusion and quality of life for those with coeliac disease. Improving the nutritional profiles of gluten-free products is expected to assist in the dietary management of individuals

adhering to a gluten-free diet.

The substantial support for gluten-free choices and educational initiatives indicates a favourable public perspective towards adapting and comprehending coeliac disease. This is promising, as public perceptions significantly influence health policies and practices. The focus on educational programs is particularly significant, reflecting the worldwide demand for improved public health information regarding coeliac disease and dietary practices.

^[12] Researchers have demonstrated that favourable public perceptions are essential for effectively promoting gluten-free diets and services for managing coeliac disease.^[14] This study highlights the necessity for diverse educational tactics about coeliac disease and underscores the importance of providing gluten-free options in public spaces, a sentiment reflected in global research. A study in Turkey revealed that public understanding and sensitivity about coeliac disease and gluten-free diets are inadequate, highlighting a global necessity for more public education and accommodation. It is essential for community members to comprehend the autoimmune characteristics of coeliac disease and its effects on the body to enhance diagnosis rates, adherence to a gluten-free diet, and the quality of life for affected individuals.^[15]

CONCLUSION AND RECOMMENDATIONS

Conclusion

1. Females demonstrated superior understanding of coeliac disease relative to males. This indicates possible gender-based disparities in health awareness or access to information.
2. Younger participants, particularly those under 18, had a diminished degree of comprehension, underscoring the necessity for age-specific teaching strategies.
3. Participants with advanced educational qualifications are correlated with enhanced knowledge, underscoring the significance of educational interventions.
4. The correlation between careers and knowledge level is negligible, indicating the influence of more pervasive societal influences.
5. Knowledge levels exhibit no significant hereditary or familial history of coeliac disease, suggesting a widespread deficiency of information even among individuals possibly more susceptible to the condition.
6. There was a consensus on the necessity for gluten-free solutions and enhanced educational initiatives on coeliac disease.

Recommendations

Based on these findings, the following recommendations are proposed:

1. Concerning adolescents and males, there is an increased necessity to design and investigate innovative educational courses and programs to mitigate misinformation among demographic groups.
2. Integrate medical information and facts on coeliac disease into the school health education curriculum to effectively target younger demographics.

3. Organise and implement community research initiatives, including study sessions and symposiums, to enhance understanding regarding the symptoms, diagnosis, and management of coeliac disease.
4. Promote social media and other digital platforms to provide clear and accessible information on coeliac disease to a broader audience.
5. Ensure that healthcare practitioners are well-informed on coeliac disease to offer precise guidance and interventions, and to engage in public education efforts.
6. Propose a policy for the provision of gluten-free food products in inventory.

Ethical Considerations is SREC13 IN 21-03-2024

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