بسم الله الرحمن الرحيم

University of Dongola

Faculty of medicine and health sciences

Department of community medicine

Research Title

Awareness and Knowledge of Celiac Disease among the Population of Dongola in 2026

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1. Introduction

1.1 Background

One type of systemic autoimmune illness is celiac disease (CD), which is characterized by a combination of various degrees of small bowel damage and clinical manifestations triggered by gluten ingestion in people who are genetically vulnerable[1].

(Gluten is the main storage protein in wheat grains. Similar storage proteins exist as hordein in barley, and avenins in oats and are collectively referred to as "gluten.").[2]

The progression of celiac enteropathy is characterized by the presence of antibodies in serum, particularly the IgA class antitissue transglutaminase, antigliadin antibodies, antiendomysial antibody acting agent, and finally, clinical signs.[3]

The clinical manifestations of CD are diverse and may present with gastrointestinal findings, extra-intestinal findings or no symptoms . Constipation, recurrent abdominal pain, bloating, and chronic diarrhea are the primary gastrointestinal symptoms. Short stature, iron deficiency anemia, and poor growth, decreased bone mineral density, dermatitis herpetiformis, delayed puberty, alopecia, neurological symptoms, headache, joint manifestations, fatigue, stomatitis, infertility, and unexplained abnormal liver enzymes are common extra-intestinal symptoms . The definitive diagnosis of CD is carried out by evaluating clinical findings,

positivity of CD specific serological tests, and characteristic histological findings in the small intestinal mucosa[1].

Currently, the only recognized and effective treatment for the disease is a strict and lifelong gluten-free diet (GFD). [4]

The pooled global prevalence of celiac disease was 1.4% in 275,818 individuals, based on positive results from tests for anti-tissue transglutaminase and/or anti-endomysial antibodies (called seroprevalence). The pooled global prevalence of biopsy-confirmed celiac disease was 0.7% in 138,792 individuals. The prevalence value for celiac disease in Africa 0.5%.[5].

The prevalence of CD in Sudan is unknown, but it was confirmed in 22.5% of Sudanese children with clinical features suggestive of the disease. [6]

Public awareness and understanding of CD are often limited. For example, a study conducted in Türkiye revealed that 43.9% of the surveyed population had never heard of the disease. [7]

1.2Problem statement:

CD can have detrimental effects on the long-term health of children and adults alike. In recent times, there has been a significant rise in the prevalence of CD which can be attributed to several factors including greater awareness regarding this disease and utilization of highly sensitive diagnostic tests . Despite that, a significant proportion of patients remain undiagnosed. [8]

1. 3Justification:

Although there are many scientific studies conducted in Sudan on celiac disease, most of them focused on diagnosis and prevalence . however,

there was a lack of studies that assessed the level of awareness and knowledge of celiac disease .

Early diagnosis is crucial for treating CD and avoid long-term complications . One of the reasons for delayed diagnosis can be the lack of knowledge about CD among the general public and primary care physicians. As CD has various systemic ramifications for affected individuals, adequate knowledge of the condition is paramount for effective preventive measures.[8]

Assessing public awareness and attitudes is crucial for effectively allocating resources and designing and implementing targeted education campaigns, screening, prevention, and treatment strategies [9].

1.4 Research Question :

What is the level of awareness knowledge about celiac disease among population of Dongola?

1.5 Hypothesis:

H0: there is a low level of awareness and knowledge about celiac disease among the population of Dongola.

H1: there is a high level of awareness and knowledge about celiac disease among the population of Dongola.

1.6 Objectives:

General Objective:

To study Awareness and Knowledge about Celiac Disease among the Population of Dongola in 2026.

Specific objectives:

1. To assess the level of knowledge about the causes of celiac disease among the population of Dongola.

2. To determine the level of knowledge about the signs and symptoms of celiac disease among the population of Dongola.

3. To assess the level of knowledge about the complications of celiac disease among the population of Dongola.

4. To assess knowledge about the risk factors of celiac disease among the population of Dongola.

5. To determine the sources of information.

2.Previous studies:

1. A study conducted in Kuwait, in 2023, survey of 350 respondents in six governates of Kuwait.less than 15% were aware of celiac disease.Better awareness regarding CD was associated with higher education levels and higher age. Among different governates, residents of Al-Asimah reported the highest awareness levels, while the rest of the governates did not differ significantly.[9]

2.A study conducted Among the Population of Riyadh, Saudi Arabia in 2024, A cross-sectional online survey was conducted among individuals aged 16 and older. In the current study, 669 individuals responded to the online survey. The majority of participants (82.1%) were familiar with CD. A total of 59.9% of respondents had adequate knowledge, 32.3% had outstanding knowledge, and 7.8% reported no knowledge of CD. This study revealed that the majority of the residents of Riyadh, Saudi Arabia, had an adequate or excellent understanding of CD.[8]

3.501 individuals in Manisa, Turkey were subjected to a survey to obtain information on demographics, awareness of celiac disease, celiac and gluten-free diet relationship, effect on social life quality and social awareness and sensitivity. Results were analyzed by chi-square test. 43.9% of the public had never heard of celiac disease before. Females were more aware of the disease and gluten-free diet dependency. Majority of the postgraduates (79.6%) recognized the disease. 44.9% of the respondents remarked that celiac patients had hesitations on dining out, while 32.3% found those people restricted for travel and holiday activities. Above one-third of subjects indicated that gluten-free product variety in the market was inadequate. However, more than half had no idea on these. Over 50% felt that, social awareness and sensitivity towards disease was unsatisfactory. This study was conducted to mirror the society's approach towards celiac patients. It was demonstrated that public's awareness and sensitivity about celiac disease was scarce. Knowledge of 'celiac' needs to be raised. [10]

3.Materials and methods :

Study design:

Analytical cross-sectional study.

Study area:

Study well be conducted in Dongola City, Northern state, Sudan.

Dongola is a city located in northern Sudan on the west bank of the Nile River, at an altitude of 227 meters above sea level. It is the capital of the northern state and is 530 kilometers north of Khartoum, the capital. The city's climate is characterized by hot

desert climate in the summer and cold winters, where the temperature drops to 20 degrees. The amount of rain is very little.

Study period:

The study will be conducted during the period from September 2026 to January 2027.

Study population:

Dongola residents aged 18 years and above.

Inclusion criteria:

Dongola residents who aged 18 years or more .

Exclusion criteria:

1. Individuals who refuses to participate.

2. Any person not living in Dongola.

3.Medical students and healthcare providers.

4. Any person who is very ill and not able to participate.

Sampling:

Sample size

Sample size will be Calculate using the following formula:

$n0 = Z^2 \times p \times q / e^2$

Where:

n0 = required sample size.

Z= standard value corresponding to confidence level (95%= 1.96).

e = margin of error(5% = 0.05).

p = expected proportion of the outcome (50% = 0.5).

q = 1 – p (0.5).

Therefore:

$n0 = (196)^2 \times 0.5 \times 0.5 \backslash (0.05)^2$

$n0 = 384.16 \approx 384$.

pilot study:10% of sample size

pilot study=10%× 384=38.4≈38

Sampling techniques:

Non probability sampling.

Sample selection procedure:

Quota sampling.

Sample frame:

Dongola City .

Method of data collection:

The data will collect using close end interviewing questionnaires .

Questionnaires questions will be in Arabic and will be assessed by pilot study.

Study variable:

Dependent:

Level of wareness and Knowledge.

Independent:

Age, gender, occupation, ethnicit، level of education.

Data analysis:

Data will be analyzed by using statistical package for the social sciences (SPSS) program. Data will be coded and analyzed. Categorical variables will be summarized as frequencies and percentages, while continuous variables will be summarized as means, medians, and standard deviations. Associated factors will be analyzed using the chi-square test.

4.Ethical consideration:

The research will conduct after the ethical approval from the department of community medicine in Dongola university faculty of medicine and health sciences, consent to participate will be taken from the participants before starting to collect data from them. They have the right to agree to participate or refuse. No personally identifying information will be collected. The collected data will be treated with complete confidentiality.

Research plan :

Jonuary	December	November	October	September	Time Task
					Preparation of research proposal
					Review of the research proposal
					Data collection
					Data and analysis
					Writing ans discussion the results

					Writing the final report
					Electronic submission of research to the Community Medicine Department.
					Research judging
					Research Editing
					Research Discussion

Budget:

Estimated budget is:

Item	Cost in SDG
Transportation	150000
Data analysis	300000
Coping	80000
Internet	100000
Total	630000

Referance:

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Disease in Bulgaria. Nutrients. 2025 Apr 4;17(7):1267. doi: 10.3390/nu17071267. PMID: 40219023; PMCID: PMC11990572.

8.Alhuzaim WM, AlDawas OD, Alazmi M, AlMutairi H, Altoom F, AlShabanat F, Sabbah BN. Knowledge and Attitude of Celiac Disease Among the Population of Riyadh, Saudi Arabia. Cureus. 2024 Sep 4;16(9):e68603. doi: 10.7759/cureus.68603. PMID: 39371695; PMCID: PMC11450511.

9. Qasem WA, Roumi AA, Al Mojil K, Sakijha H, AlMughamis N. Awareness of celiac disease among the public in Kuwait: a cross-sectional survey. BMC Res Notes. 2023 Jul 3;16(1):133. doi: 10. TAŞKIN, Bilge; SAVLAK, Nazlı. Public awareness, knowledge and sensitivity towards celiac disease and gluten-free diet is insufficient: a survey from Turkey. Food Science and Technology, 2020, 41.1: 218-224 .