T.C. YEDITEPE UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS

TURKISH VALIDITY AND RELIABILITY OF CELIAC DISEASE DUTCH QUESTIONNAIRE (CDDUX)

MASTER OF SCIENCE THESIS

NUR ECE ÖZTAŞ ŞÜKÜR

İstanbul, 2022

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SUPERVISOR

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APPROVAL

This thesis has been deemed by the jury in accordance with the relevant articles of Yeditepe University Graduate Education and Examinations Regulation and has been approved by Administrative Board of Institute with decision dated 13.08.2021 and numbered 202106061.

Prof. Dr. Bayram YILMAZ

Director of Institute of Health Sciences

DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

Date
30.11.2021
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ABBREVIATIONS

ACG	American College of Gastroenterology
CD	Celiac Disease
CDDUX	Celiac Disease Dutch Questionnaire
DC	Dentritic cells
DGP	Deaminated gliadin peptide
EMA	Anti-Endomysial antibody
ESPGHAN	The European Society for Paediatric Gastroenterology Hepatology and Nutrition
GFD	Gluten-free diet
HLA	Human Leukocyte Antigen
HRQoL	Health Related Quality of Life
IFN	Interferon
IgA	Immunglobulin A
IL	Interleukin
KMO	Kaiser-Meyer-Olkin index
Max	Maximum
Min	Minimum
NASPGHAN	North American Society for Pediatric Gastroenterology, Hepatology and Nutrition
NHANES	National Health and Nutrition Examination Survey
PedsQL	Pediatric Quality of Life Inventory
QOL	Quality of Life
TG2	Tissue Transglutaminase 2 Enzyme
TH1	T Helper 1
TJ	Tight junctions
TTG	Tissue Transglutaminase Antibodies
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

ABSTRACT

Oztas Sukur, NE. (2022). Turkish Validity and Reliability of Celiac Disease Dutch Questionnaire (CDDUX). Yeditepe University, Institute of Health Science, Department of Nutrition and Dietetics, Master Thesis, Istanbul.

The QoL of the patients with CD may be low, especially because they have many gastrointestinal complaints before the diagnosis. Strict adherence to the GFD after diagnosis ensures symptom control and is a prerequisite for improving QoL. But on the other hand, the strict GFD causes serious social limitations in their daily lives and their QoL may still be low. The health-related QoL in patients with CD which is a good indicator for patient-reported outcome of the health has been considered important in both medical research and clinical practice. It is aimed to test the validity and reliability of the CDDUX in Turkish children with CD which is the most used worldwide to evaluate the QoL the children with CD. The tool showed high or excellent internal consistency for both children and their parents (Cronbach's Alpha Scores:0.86 (children), 0.89 (parents)). A generic QoL instrument, PedsQL scale which was used for testing the convergent validity of the Turkish CDDUX, showed statistically significant weak positive correlation with both forms of CDDUX (child and parent). There was a positive and statistically significant correlation between the forms of CDDUX children and parents. The only variable affects the CDDUX parents score was marital status. There was no significant correlation between the other parameters for both forms of the CDDUX. The Turkish version of the CDDUX is an acceptable, valid, and reliable scale for the assessment of QoL the children who have CD.

Keywords: QoL, Celiac Disease, Diet, Gluten Free, Validity and Reliability

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ÖZET

Oztas Sukur, NE. (2022). Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği. Yeditepe Üniversitesi, Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı, Master Tezi, İstanbul.

Çölyak hastalarının yaşam kalitesi, tanı öncesi çok sayıda gastrointestinal şikayetleri olduğu için düşük olabileceği gibi tanıdan sonra da glutensiz diyete ragmen düşük olabilmektedir. Glütensiz diyete katı bir şekilde uyum semptom kontrolünü sağlamanın yanısıra yaşam kalitesini iyileştirmek için bir ön koşuldur. Ancak katı glutensiz diyet hastaların günlük yaşamlarında sosyal kısıtlanmalara neden olmakta ve yaşam kalitelerinin düşük olmasına yol açabilmektedir Sağlığın hasta tarafından bildirilen sonucu için iyi bir gösterge olan hastalıkla ilgili yaşam kalitesi ölçekleri, hem tıbbi araştırmalarda hem de klinik uygulamalarda önemli olarak kabul edilmiştir. Bu çalışmada çölyak hastalığı olan çocuklarda yaşam kalitesini değerlendirmek için dünya çapında en çok kullanılan ölçek olan CDDUX'un Türkçe geçerlik ve güvenirliğinin araştırılması amaçlanmıştır. Hem çocuklar hem de ebeveynleri için Cronbach Alfa skoru oldukça yüksek saptanmıştır (0.86 (çocuklar), 0.89 (ebeveynler)) Türkçe CDDUX'un geçerliliğini test etmek için kullanılan genel bir yaşam kalitesi ölçeği olan PedsQL, CDDUX'un her iki formuyla da (çocuk ve ebeveyn) istatistiksel olarak anlamlı zayıf pozitif korelasyon göstermiştir. CDDUX'un çocuk ve ebeveyn formları arasında anlamlı pozitif korelasyon saptanmıştır. CDDUX ebeveyn skorunu anlamlı olarak etkileyen tek değişken ebeveynlerin evlilik durumudur. CDDUX çocuk ve ebeveyn formları için diğer parametrelerle anlamlı bir farklılık saptanmamıştır. CDDUX'un Türkçe versiyonu, çölyak hastalığı olan çocuklarda yaşam kalitesinin değerlendirilmesi için kabul edilebilir, geçerli ve güvenilir bir araçtır.

Anahtar Kelimeler: Yaşam Kalitesi, Çölyak Hastalığı, Diyet, Glutensiz, Geçerlik ve Güvenilirlik

1. INTRODUCTION AND PURPOSE

A well-established indicator of the health of the children who have chronic diseases is the health-related quality of life (HRQoL) scale, the result of which is reported by the patient[1]. Chronic diseases such as celiac disease (CD) can reduce the quality of life (QoL) in children[2].

The QoL of the patients with CD may be low, especially because they have many gastrointestinal complaints before the diagnosis. Strict compliance to the gluten-free diet (GFD) post diagnosis ensures symptom control and is a prerequisite for improving QOL. But on the other hand, the strict GFD causes serious social limitations in their daily lives and their QoL may still be low[3].

Recently, the HRQoL of the patients with CD has been considered important in both medical studies and also practice[3]. HRQoL can be evaluated with different tools. It can be evaluated by general instruments, as well as disease-generic or disease-specific tools can be used. The instruments which are disease-specific are important for assessing the disease of interest because of their distinctiveness and sensitivity about minor differences and changes.[2]. QoL tools are generally designed as top-down tools, while disease-specific tools are designed bottom-up. Top-down instruments reflect the researcher's point of view, while bottom-up instruments were developed from the child's perspective[2]. Celiac Disease Dutch Questionnaire (CDDUX) is the first questionnaire developed for this purpose to assess QoL the children who have CD, and there are many cultural adaptations in the literature[2,4–10].

In Turkey, recently, while reporting our study one more specific instrument published to evaluate HRQoL the children with CD called Celiac Disease Specific Pediatric Quality of Life Scale (CDPQOL)[11].

We aimed to evaluate the validity and reliability of the CDDUX in Turkish children with CD which is the most used worldwide to evaluate the QoL among children with CD in this study. Cross-cultural adaptation of a measurement tool is very important in terms of international comparability due to the increasing number of multinational studies as well as enabling a valid disease specific tool for the assessment of the QoL of the children with CD.

2. LITERATURE REVIEW

2.1. Celiac Disease

2.1.1. Definition

CD is a chronic disease, mediated by immunity, triggered and maintained by dietary gluten exposure and its related prolamins in the individuals who are genetically predisposed. CD is characterized by symptoms that occur when gluten is consumed, autoantibodies, the presence of genetic predisposition, and enteropathy[12]. CD can be seen at any age, also in the pediatric population[13].

2.1.2. History

Celiac disease may have an ancient history, first referred to as "koiliakos" in Greek which means "coeliac" in texts written by the Cappadocian Aretaesus, who lived in the second century Before Christ. The term 'coeliac,' means 'abdominal'[14]. Francis Adams translated Aretaesus' study and published it in 1856 by the Sydenham Society[15]. The first clear definition of the disease was described by Samuel Jones Gee in 1888 in pediatric patients in Northern Europe. Dr. Samuel Jones Gee stated for the first time that the disease can be present in all ages and genders[13,14]. He also suggested that dietary treatment might be of benefit[14,16]. In 1924 Sidney Haas described a diet based mostly on bananas in who he had diagnosed CD[13,14].

The doctoral thesis of Dr. Willem Karel Dicke, a Dutch pediatrician, in 1950 established that there is a significant improvement in general condition and a significant decrease in oily diarrhea after removing wheat, rye and oats from the diet[16]. When there was a wheat shortage during World War II, a decrease in mortality was observed the children with celiac disease[14]. In 1954, Paulley demonstrated the histopathological changes in the small intestine[14,17]. A German group revealed in 1997 that celiac disease is an autoimmune disease associated with a specific gene and cited the enzyme tissue transglutaminase, but they noted that environmental agents like gluten are also important[14,18].

2.1.3. Epidemiology

Despite the prevalence of CD has increased dramatically over the past 50 years, it still represents an iceberg with more cases to be diagnosed[3]. It is thought that there are many undetected CD patients worldwide[3].

In a systematic review about prevalence of CD worldwide, the serological prevalence was found to be 1.4%, differing by continent (South America, 1.3% in 11 studies, Asia, 1.8% in 20 studies)[19]. Again in this study, the prevalence of biopsy-diagnosed CD was found to be 0.7%,

and it also varies according to the continent and region (In Afrika 0.5% , in Europe 0.8%)[19]. The prevalence of the CD is increasing over time. In a study; while the prevalence of CD was 0.6% from 1991 to 2000, it was 0.8% from 2001 to 2016[19]. Alongside increasing awareness, there is proof that the true incidence of the CD is increasing, which in turn influences the prevalence of CD[20–22]. In a study, it is reported that, the incidence of the CD showed substantial increases in diagnosis rates over time in 24 (73%) of 33 studies[23]. It has been reported that the main reasons underlying the incidence trend of the CD may be due to increased awareness among physicians, screening of at-risk groups, and adoption of new serological tools[24].

With the prevalence increasing all over the world, CD prevalence varies between the regions in the world depending on geographical variations. While the prevalence is close to 1% in Europe and the United States, CD is observed less frequently in East Asian countries (China, Mongolia, Korea, and Japan). It is thought that the reasons such as less gluten consumption and lower population prevalence of HLA-DQ2 and DQ8 are responsible for this result[25].

CD can occur at any age, including in geriatric populations. Some of the people diagnosed at an advanced age may be due to the late diagnosis of the ongoing disease because of atypical signs or vague symptoms, and some may be caused by a newly developed gluten intolerance[20]. However, new prospective cohort studies indicate that CD autoimmunity develops before the age of 10[21].

The biopsy-proven CD prevalence was found to be approximately twice as high in children as in adults[26].

The incidence of CD in women (17/100,000) is higher than in men (7.8/100,000)[20]. Biopsy-proven CD prevalence in women is 1.5 times higher than in men[26].

According to data which is taken from the National Health and Nutrition Examination Survey (NHANES), black non-Hispanic individuals showed 0.2% seroprevalence and Hispanic individuals showed 0.3%, while white individuals showed 1.0% seroprevalence. These data reflect racial differences in CD[22].

Although there is no difference between geographical proximity or HLA typing in some countries, it has been observed in studies that the prevalence of CD varies greatly between countries. Such differences suggest that environmental exposures as possible risk factors need to be further investigated in the pathogenesis of CD[20].

The biopsy-proven CD prevalence was found to be 1:115-1:212 in healthy school children's screenings in our country. The seroprevalence of CD in our country was found to be 1:58-1:158 in various studies[27,28]. In a study conducted in adults on our country, biopsy-confirmed CD prevalence was 1:256, while the seroprevalence was 1:129[29].

2.1.4. Etiopathogenesis

CD is an inflammatory enteropathy mediated by T cells and manifests itself in individuals carrying related genes, together the environmental and genetic factors which play a role in mechanism[30]. Genetic susceptibility, adaptive immune response induced by gluten exposure, loss of intestinal barrier function, and an intestinal dysbiosis are thought to be involved in the pathogenesis of CD[31].

The main determinants of genetic susceptibility to CD are the major tissue compatibility class II HLA class II DQA and DQB genes. These genes are encoded by the major tissue compatibility region on the short arm of chromosome 6. More than 95% of patients with CD have the HLA-DQ2 heterodimer, while the most of the other patients have the HLA-DQ8 heterodimer[12,30]. Outside of these regions, there are several CD-related genomic domains that control immune responses, as well as genes encoding like SH2B3, CTLA4, RGS1, IL21, CCR3, IL12A, IL2, IL-18RAP and TAGAP[12].

The most important environmental cause of CD is gluten, which is found in wheat, barley and rye. Gluten is a heterogeneous mixture of storage proteins and is rich in glutamine and proline content and are its parts are gliadins(alcohol-soluble) and glutenins(insoluble)[30,32]. In gliadins, the glutamine content is 35-38%, the proline content is 13-17% of the whole amino acids. This high amount of proline makes gluten partly resistant to digestive enzymes and causes large peptides to pass into the small intestine[30]. Glutamic acid is formed as a result of post-translational deamination of glutamine by tissue transglutaminase 2 enzyme (TG2) in the lamina propria, and immunogenic areas contain residues of this glutamic acid[30,31]. Glutamic acid residues confer negative charges on gluten, and deamide domains are admitted in by the dendritic cells (DC) carrying HLA-DQ2 and HLA-DQ8 haplotypes[33]. Antigen-presenting cells (DC), present the peptides to gluten-specific T cells, triggers both innate and adaptive immune response[32]. Since the deamidated gluten peptides presented to the DC, CD4+T cells are activated and the immune response begins. [33]. Cytokines like interleukin (IL)-15 and interferon-gamma (IFN)-y stimulate dendritic cells and initiate the innate immune response[31]. On the other hand, stimulated gluten-specific CD4+T cells can cause excessive activation of various immune functions[33]. The adaptive response produces inflammatory cytokines. These cytokines activate T helper (Th)1 cells that produce IFN-y and IL-21, which cause epithelial tissue damage, inflammation, and tight junctions (TJ) damage[32,33]. It also activates Th2 cells, which supports the development of B-lymphocytes into plasma cells. The resulting plasma cells also produce anti-gliadin and anti-tissue-transglutaminase antibodies[32,33]. CD4+ T cells and gluten contact with each other in the lamina propria, cytokines and various factors' production and proliferation

is increasing. It leads to crypt hyperplasia, an increase in intraepithelial lymphocytes, and villous blunting, which are the histopathological properties of the disease[31,34].

Along with these, the permeability of TJ in the intestines increasing by zonulin which is an intestinal peptide up-regulated by gliadin prolamin[32]. In some studies, it has been shown that zonulin levels are increased in patients with CD, and it is mainly blamed in the pathogenesis of the disease[32,35]. It is known that normally the intestinal epithelial barrier is not permeable to macromolecules such as gliadin[33,36]. But in CD, peptide transport is increased paracellularly and transcellularly into the lamina propria due to zonulin upregulation which is an intestinal peptide involved in TJ regulation[32,33].

The lack of 100% concordance of CD in monozygotic twins, increasing CD prevalence, initiating in adulthood despite early exposure to gluten and there are also patients with CD who do not show clinical improvement despite a strict GFD suggests that there are extra factors like infections and differences in the intestinal microbiota in the pathogenesis of the disease[33]. It has been shown that patients with symptoms despite a long-term diet have changes in their gut microbiota[33]. Studies have shown that the ratio of Firmicutes to Bacteroides and Actinobacteria decreased in children with CD compared to healthy children[37]. Currently, further studies are needed to definitively explain how gluten exerts its immunological effects[33].

2.1.5. Presentation

CD can present different non-specific signs and symptoms. The average diagnosis age has risen from <2 to 6–9 years in children in many developed countries mainly due to the increasing number of asymptomatic patients diagnosed with CD[24]. Because it can lead to adverse health outcomes, it should be diagnosed in asymptomatic people as well as in people with gastrointestinal symptoms[12].

Various classifications of the CD (classic/ atypical/ asymptomatic/ latent and potential CD) have been used in the literature[38]. The European Society for Paediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) suggests that to use the terminology: gastrointestinal symptoms and signs and extraintestinal symptoms and signs, due to atypical symptoms can be more common than classical symptoms[12]. The gastrointestinal symptoms of those diagnosed in childhood are predominant, and approximately half of the patients have diarrhea and chronic constipation[12]. In studies conducted in Canada, 90% of the patients reported abdominal pain, but since abdominal pain is commonly observed in childhood, it may not be an indicator of the disease[12]. The rate of celiac disease was found to be between 10% and 40% only in patients with growth retardation[12]. When celiac disease was investigated in children with iron deficiency anemia, it was observed that it was found at a rate of 15%[12].

Chronic conditions like diarrhea, constipation, cramping, bloating, nausea, vomiting, abdominal pain, fatigue or growth retardation, weight loss, delayed puberty, iron deficiency anemia, amenorrhea, recurrent aphthous stomatitis (mouth ulcer), rashes like dermatitis herpetiformis, fractures with insufficient trauma, osteopenia/osteoporosis, and abnormal liver biochemistry for whom there is no other explanation for CD, and asymptomatic children with increased risk for CD (type 1 diabetes, Turner syndrome, Down syndrome, autoimmune thyroid disease) should be screened[12].

Silent CD is a definition for people who have positive antibody, genetic predisposition, and histopathological features consistent with CD, but without adequate symptoms and signs to suggestive clinical suspicion. Latent CD is a patient with a genetic predisposition, gluten-associated enteropathy in their lifetime, but now no enteropathy, regardless of symptoms and antibodies. Potential CD describes a condition in which positive antibodies but no histological abnormalities are observed, with a genetic predisposition, regardless of the symptom[12].

2.1.6. Diagnosis

2.1.6.1. Antibodies

There are highly specific autoantibodies directed against the antibodies transglutaminase-2 (TG2) and Deamidated Gliadin Peptide (DGP) in the CD. Anti-Endomysial antibody (EMA) are directed against extracellular TG2[12]. These antibodies are of the Immunglobulin (Ig)A class, except for DGP antibodies, and if the CD is suspected, the total IgA level in the serum should be obtained as the first test[12,39]. In children with normal serum level of IgA, after making sure that the child has consumed gluten, Tissue Transglutaminase Antibodies (TTG) IgA should be used at first step, regardless of age[12,39]. TTG IgA antibody is the least costly and most reliable screening test in the diagnosis of CD[40]. In children with low total IgA concentration (low for age or <0.2 g/L over 3 years), IgG-based antibodies (DGP, EMA, or TGA) are looked for as a second step[12,39].

In recent years, a non-biopsy diagnostic approach has been applied in children[39]. The ESPGHAN guidelines in these last years stated that if clinical features are present, the TTG-IgA serum concentration is ≥10xULN, the diagnosis is made without biopsy in people with positive EMA-IgA as the second test[39].

Since TTG IgA test sensitivity may be low in children under 2 years of age, the screening algorithm for screening is controversial in these children[40]. While ESPGHAN recommends TTG IgA as the initial test regardless of age, either the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) or American College of Gastroenterology (ACG) state that DGP IgG should be added to increase the diagnostic

accuracy[39,41,42]. In a recent meta-analysis, it was stated that the second recommendation may increase diagnostic accuracy under 2 years of age, especially in patients with strong clinical suspicion for CD[40].

IgG or IgA antibodies against to native gliadin have low specificity and sensitivity[12].

Determine of antibodies (IgG, IgA, secretory IgA) in stool specimens is not reliable for diagnosis[12].

The diagnostic accuracy of these tests which were documented in European Society for the Study of Coeliac Disease (ESsCD) guideline are shown in Figure 2.1[3].

Current algorithms published by ESPGHAN 2020 for diagnosis in children with CD are given in figures 2.2 and 2.3[43].

Antigen	Antibody type	Sensitivity, % (range)	Specificity, % (range)
Gliadin	IgA	85 (57–100)	90 (47–94)
	IgG	80 (42–100)	80 (50–94)
Endomysium	IgA	95 (86–100)	99 (97–100)
	IgG	80 (70–90)	97 (95–100)
Tissue transglutaminase	IgA	98 (78–100)	98 (90–100)
	IgG	70 (45–95)	95 (94–100)
Deamidated gliadin peptide	IgA	88 (74–100)	90 (80–95)
	IgG	80 (70–95)	98 (95–100)

Figure 2.1. The diagnostic accuracy of the serological tests in CD/ European Society for the Study of Coeliac Disease (ESsCD) guideline[3]

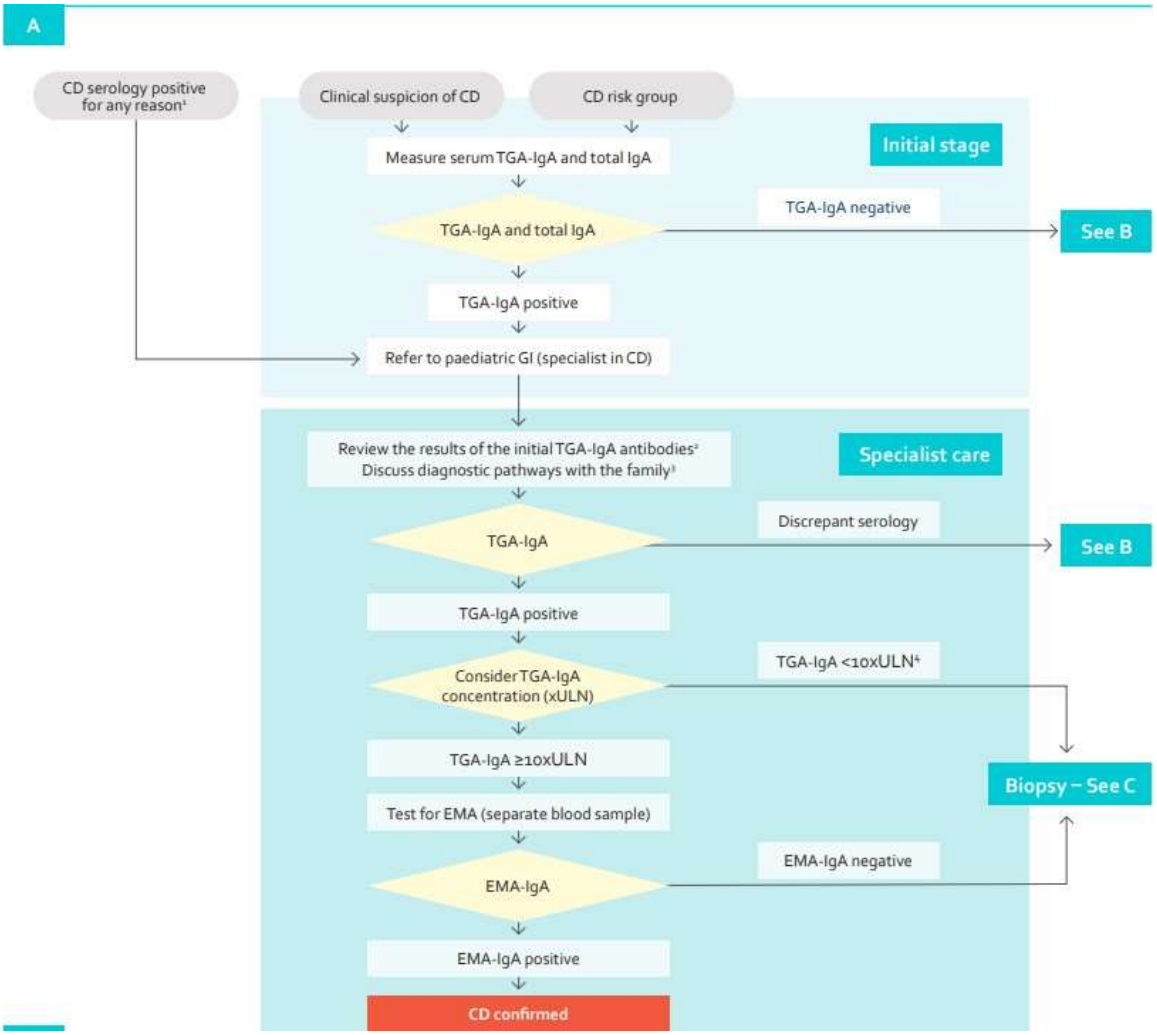

Figure 2.2. The algorithms for diagnosis/ ESPGHAN 2020[43]

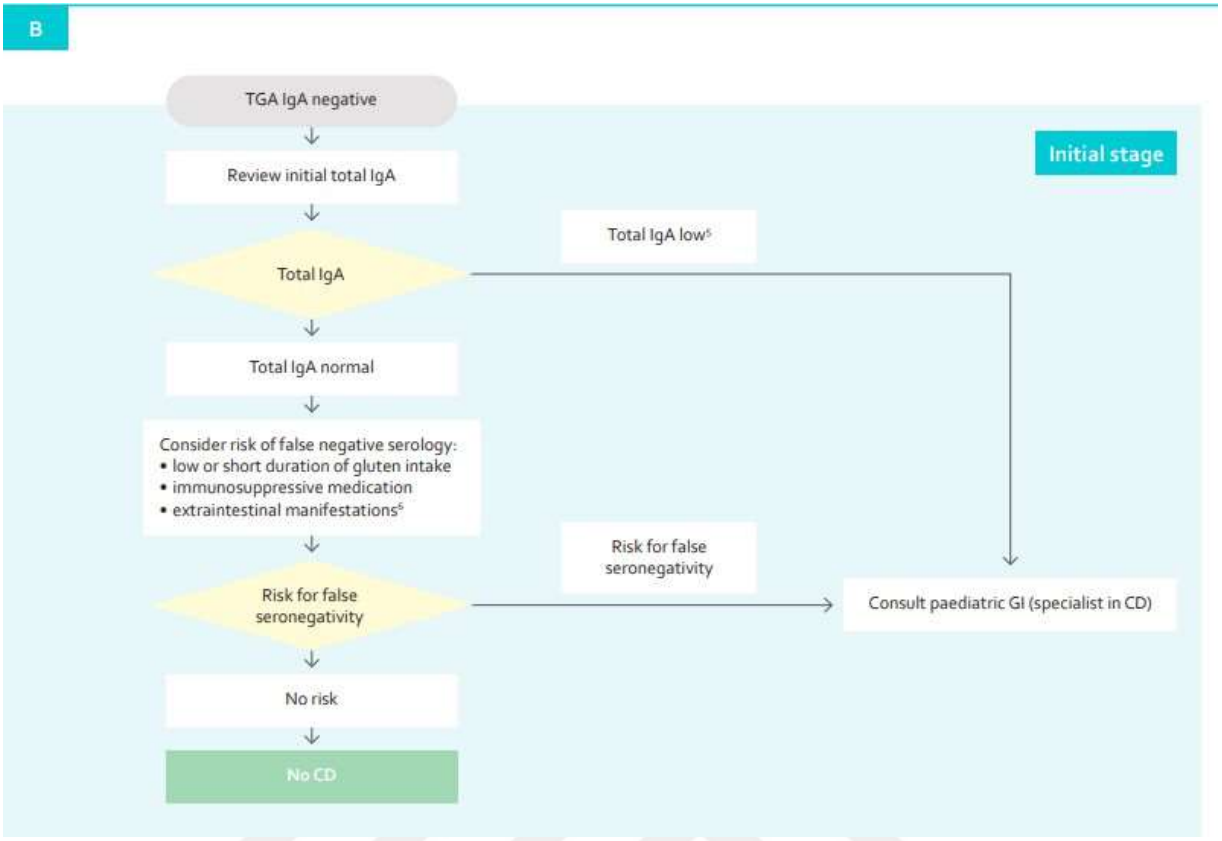

Figure 2.3. The algorithms for diagnosis/ ESPGHAN 2020[43]

2.1.6.2. Biopsy

Endoscopic biopsy is taken from the duodenum for diagnosis[43]. These tests are meaningful if the patient is consuming gluten-containing diet[44]. Histological abnormalities observed in CD include villous atrophy (partial to total), crypt hyperplasia, decreased villus/crypt ratio, intraepithelial lymphocytosis, increased mitotic index in crypts, increased IEL mitotic index. Also, abnormalities may be seen in epithelial cells[12].

Histopathological evaluation is made according to the modified Marsh – Oberhuber classification for diagnosis or to evaluate the histopathology after a GFD[3]. It is shown in Figure 2.4 as in shown Aljada's article[32].

Modified Marsh-Oberhuber classification system.

Type	Intraepithelial Lymphocytes/100 Enterocytes (Duodenum)	Crypt	Villous Architecture	Lesion
0	<30	Normal	Normal	Pre-infiltrative
1	>30	Normal	Normal	Infiltrative
2	>30	Hyperplasia	Normal	Infiltrative-hyperplastic
3a	>30	Hyperplasia	Mild atrophy	Flat destructive
3b	>30	Hyperplasia	Marked atrophy	Flat destructive
3c	>30	Hyperplasia	Complete atrophy	Flat destructive

Figure 2.4. Modified Marsh – Oberhuber classification/Aljada B, Zohni A, El-Matary W. The Gluten-Free Diet for Celiac Disease and Beyond[32]

Although the changes mentioned above are not pathognomonic for CD, they can also be seen in other diseases such as cow's milk/soy protein hypersensitivity, persistent infant diarrhea, Giardia lamblia infection, some immunodeficiencies, tropical sprue and bacterial overgrowth, so they should always be evaluated together under the patient's clinic, serology, and gluten-free diet[12].

Children with low TTG-IgA positive titers (<10 times the upper limit of normal) should be evaluated with at least 4 biopsy from the distal duodenum and one from the ampoule while on a gluten-containing diet[39]. The algorithm shown in Figure 2.5 according to ESPGHAN 2020 criteria[43].

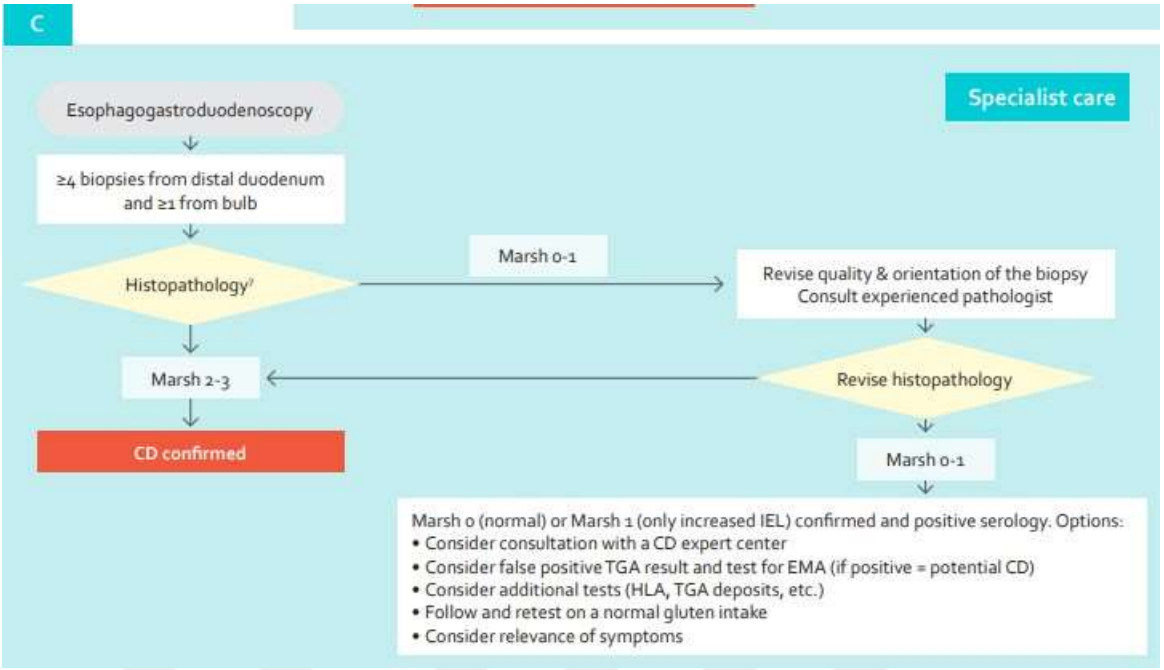

Figure 2.5. The algorithm for esophagogastroduodenoscopy evaluation/ESPGHAN 2020[43]

2.1.6.3. Gluten Challenge

Although gluten challenge is not required in most cases to detect CD, it can be required under special situations when the diagnosis is in doubt and should be performed under strict clinic control by a specialist. As stated in Husby's report, gluten challenge should be avoided until the child reaches 5 years of age or during the growth periods in adolescence[12]. The challenge should be done by making sure while the patient was taking enough gluten amount in the diet, and the level of celiac antibodies should be measured during this time[12].

2.1.6.4. HLA Testing

Although there is a strong genetic relation in CD, most of the patients are HLA-DQ2 and/or HLA-DQ8 positive[12]. HLA-DQ2/HLA-DQ8 negativity indicates very low risk for celiac disease[12,39]. The application of genetic testing is controversial. If TTG-IgA positive patients who are suitable for biopsy have biopsy or serum TTG-IgA at least 10 times higher and EMA-IgA positivity, HLA test is not required[27]. Although HLA-DQ typing is not recommended by ESPGHAN to confirm the TTG-IgA positivity in its final guideline, genetic testing is recommended in the literature for patients on GFD either immunosuppressive therapy who are risky for false negative serology.[13]. The algoritm for HLA testing in children shown in Figure 2.6[43].

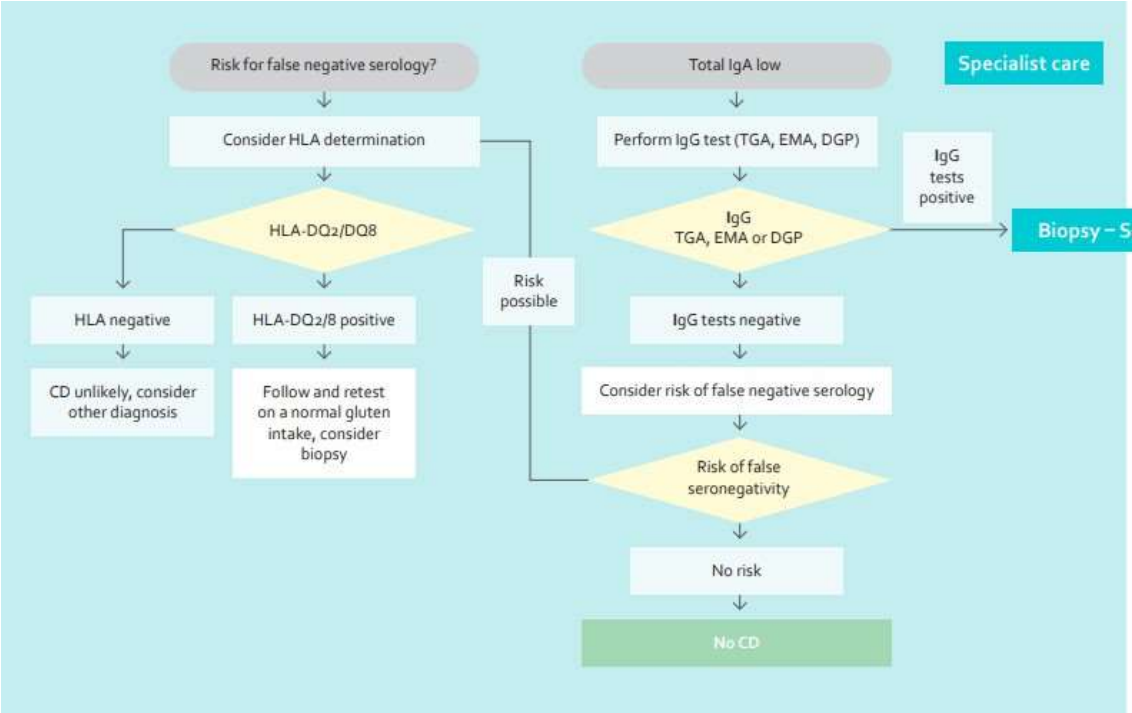

Figure 2.6. The algorithm for HLA Testing in children with CD/ESPGHAN 2020[43]

2.1.7. Treatment

2.1.7.1. Gluten Free Diet

Currently, the only treatment is strict GFD[39]. Although many new methods for the treatment of CD are being researched, the only and effective treatment method is still a lifelong GFD. Avoiding products containing wheat, barley and rye is necessary. Opinions on removing oats from the diet of patients with CD are still controversial[45]. Beside the benefits of oats in GFD, there are still many scientific and clinical questions to be answered[46]. Although it will be consumed, considering the source of the oat used and the selected variety, care should be taken in terms of cross-contamination[45]. Since even very small amounts of gluten intake are harmful, it is necessary that all medicines and foods taken should be free of gluten[47]. One of the most important points to be careful about is the consumption of many nutrients and foods that do not normally contain gluten, but which are added to gluten for commercial reasons, by being exposed to cross-contamination[38,45].

2.1.7.2. Future Pharmacological Options

Despite the GFD has been shown to be safe and effective in most of the patients with CD, the difficulty of maintaining a GFD increases the need to develop new treatments. Multiple

promising agents are in development[48].

In this way, it is aimed to prevent the gluten transition between the tight connection. Phase 2 studies of Larazotide acetate, a zonulin antagonist, were completed in order to prevent gluten transition between tight junctions and phase 3 was initiated[48,49].

Latiglutenase is used as a recombinant enzyme and is used to shorten long-chain gliadin-derived oligomers and thought that it may be play a role in treatment. Phase II research is in progress[48]. Although vaccine treatment is one of the preferred options among alternative treatments in patients with CD, phase 2 studies of the vaccine called Nexvax2 are continuing. Although Nexvax2 shows a good safety profile, its efficacy has not yet been proven and is specific only to individuals with the HLA-DQ2 genotype[48].

Another investigated approach in the preclinical phase is genetic modification of flours[48]. Supplementation with a probiotic is among the therapeutic options to correct the imbalance in the gut microbiota[37,48].

2.1.8. Follow-up and Prognosis

Periodic monitoring of children diagnosed with celiac disease for symptoms, growth, physical examination, and compliance with a GFD is recommended[38]. The prognosis of the disease progresses in parallel with adherence to diet. Individuals who comply with the life-long GFD have a healthy life span. Studies have shown that the GFD has a strong impact on diet-related QoL[50]. Barriers including access to gluten-free products, high prices, difficulties in social life, safety of gluten free products, possible difficulties in adapting to diet can negatively affect quality of life[51,52]. Since the diet for the patients with CD diagnosed in childhood is usually initiated by the parents and continued under their supervision until adolescence, children may not remember their complaints at the time of diagnosis and there may be difficulty in complying with the diet[51,53].

Although routine follow-up is required to strengthen adherence to a GFD, there are differences in the literature on follow-up practices[52]. Regular follow-up is important to help patients with CD achieve GFD compliance, thus maintaining their quality of life and preventing complications[52]. Celiac patients should be followed up in these aspects every 6 months from diagnosis and a follow-up plan should be established in primary care[38].

It is known that many complications can be prevented by GFD, which is the only treatment method with proven effectiveness today. The prognosis of CD is very good in patients who comply with the diet. Some patients who doesn't respond to the GFD has increase morbidity and mortality due to very rare serious complications[38].

In addition to the difficulty of complying with a strict GFD, unintentional exposure to

gluten is unavoidable for patients.

2.1.8. Celiac Disease and Life Quality

World Health Organization (WHO) states the health definition is a whole wellbeing physically, mental and socially and not only the absence of either a disease or infirmity[54]. It is important to evaluate the QoL with this holistic perspective. It has become a valid and important tool for evaluating the benefits, costs and efficacy of new treatment strategies[55]. GFD which is the treatment for CD includes come changes[56]. With this it requires a lifelong eating habit and lifestyle[4]. The requirement for lifelong adherence to a restrictive diet, such as GFD, in these patients, along with other consequences of the disease, may affect QoL[4,56,57]. A child's development, growth, self-concept, identity and mental health can be affected by a disease that starts in childhood and children are faced with new challenges throughout childhood and the QoL of these children may change in a negative way in terms of physical, psychological and social aspects[58]. Patients may feel embarrassment, afraid of eating something containing gluten, and fear of being uncomfortable[58]. In the treatment of CD, the involvement of family members is very valuable in terms of adherence to diet and coping with the disease[59]. Parents of children with CD may be concerned about coping with the disease and may need professional support[58]. These reasons are important in how the disease affects the lives of these people.

Therefore, it is very important to assess the impact of GFD on patients' QoL and to demonstrate it with approved tools[4]. Measuring HRQoL is difficult as it includes both objective and subjective conditions[58]. The best way to HRQOL is assessed through questionnaire. HRQoL is a multidimensional concept aimed at measuring well-being by considering experiences in the physical, emotional, social and cognitive domains[4]. QoL may be measured using both general and disease-specific questionnaires[60]. General questionnaires measure activity of daily life in patients with various disorders, while specific ones measure QoL specific to that disease[57]. Disease-specific QoL questionnaires are a valuable tool for assessing the challenges faced by parents or caregivers of children due to this chronic illness[59]. Generic questionnaires which generally used worldwide for kids are KIDSCREEN-52 and Pediatric Quality of Life Inventory (PedsQL)[61,62]. A group produced the Coeliac Disease Dutch Questionnaire (CDDUX) to measure the QoL of 8-18 year old children and parents with CD after using a questionnaire (TACQOLCD) containing specific questions for celiac disease for the first time[63]. CDDUX is the first pediatric disease specific HRQoL tool as it builds on the previous version to try to take information from the child's point of view[2,7]. The CDDUX was produced by taking the data from focus groups with children and their parents. It provides information from the child's point

of perception, allowing assessment of the consequences of illness and the assessment of how children and their family members thinks about the illness and needs to follow this diet[7]. CDDUX appears to be more sensitive in detecting in clinical differences[57]. The CDDUX is the most frequently used tool and was implemented in a number of different languages[2,5,7,8,64]. Other CD QoL in the literature were created by adding additional questions to existing generic questionnaires or using different methodologies, reflecting the unique characteristics of life with CD[65–71].

In recent years, studies have been conducted due to the increasing interest in the detection of HRQoL the patients with CD. While in some previous studies in the literature indicate that children with CD who follow a strict GFD have the same high HRQoL as healthy children in recent studies shows that children who are CD has obviously lower HRQoL than the healthy controls[62,63,72,73]. Some studies show that the quality of life that parents report about their children is lower than that of their childrens' self-report[58,64,74]. But all these instruments are not specific for celiac disease.

In Turkey, recently, while reporting our study there is an another specific tool published to evaluate HRQoL in children with CD called Celiac Disease Specific Pediatric Quality of Life Scale (CDPQOL)[11]. It includes two scale for different age groups. It is not mentioned the results of children in that paper.

3. MATERIALS AND METHODS

3.1. Participants

This study is a validity and reliability study and an observational study based on a questionnaire. Children with CD in the 8-18 age group, who were members of the Celiac Society or Life with Celiac Society between the dates of the research, and their parents constitute the universe of the research. This study is conducted between October 2021 - December 2021.

The sample of the research is aimed to be composed of the whole universe, but in order to complete the study, after the language validity of the questionnaire was provided, the number of samples in which would be conducted was determined as 10 times the number of questionnaire items and calculated as 120, including at least 132 children and parents (mother or father) considering 10% wastage[75]. 160 family participated to the research, but the questionnaires was completely finished by 146 family. Missing data removed from the study.

The necessary permission was obtained from the Celiac Life Association and the Celiac Association Board of Directors. Before starting the study, a written voluntary consent obtained from the children and their parents that they volunteered to involve to the study **(Appendix 7.2.)**. Inclusion criteria; Being a child between the ages of 8-18 with celiac disease (by personal statement), being a member of the Celiac Life Association or Celiac Association of the child or parent, being a volunteer. Exclusion criteria: Participants under the age of 8 participants without written voluntary consent, participants who are not members of the specified associations.

The data was obtained via the online survey method. An e-mail was sent to all members of the Celiac Life Association and the Celiac Association and also the data obtained with Whatsapp and social media.

Approval of the Ethics Committee dated 31.08.2021 from the Yeditepe University Non-Invasive Clinical Research Ethics Committee **(Appendix 7.3.)**, and the approval dated 30.11.2020 from the Board of Director Celiac Association and 20.11.2020 from the Board of Director Celiac Life Association **(Appendix 7.1.1. and 7.1.2.)**.

3.2. Data Collection

The Pediatric Quality of Life Inventory (PedsQL) forms for 8-12 age and 13-18 age groups and the Turkish-adapted form of the Celiac Disease Dutch Questionnaire (CDDUX) with basic demographic information was conducted to evaluate the QoL of children and their parents aged 8-18 years with CD was applied by the researchers by online survey method whose consent was obtained after language validity was obtained.

3.2.1. Sociodemographic Data Collection

The data was collected **(Appendix 7.5.1.)** in three sections: demographic data about the patient, demographic data about their parents, and other data about the child's disease.

Collected demographic data about the patient includes the patient's age, gender, educational level, school type, number of siblings, and where he/she lives (rural, county, province). Patients were parted into two groups according to age: between 8-12 years and between 13-18 years.

Information obtained from parents were the mother's or father's, educational level, marital status, income status (e.g..my income is more than/equal/less than my expenses).

Other information about child's disease includes age at which celiac disease was diagnosed, whether there is anyone in the family with a diagnosis of celiac disease, whether the child has an additional chronic disease.

Personal information such as demographic characteristics were as a multiple choice or gap-filling and their answer was filled by who filled the data. These are the independent variables.

3.2.2. Celiac Disease Dutch Questionnaire (CDDUX)

CDDUX includes 12 items which are in three parts. First one is, "having CD" which is 3 items, it supplies the data from the children' feelings either when somebody suggest foods containing gluten or when thinking about foods including gluten. Second one is, "communication" which is 3 items, it provides supplies the information the children' feeling when speaking to others about CD or describing what the illness is. Third one is, "diet" which is 6 items, it supplies data about children' feelings about how to follow this strict diet for lifelong or can't eat what others eat[2]. **(Appendix 7.5.2.)**

This tool has a one version for children or adolescents and one for parents. There are 5 answer options for each question (very good, good, neutral, bad, very bad), which appear as different facial expressions to reflect emotions. Answers given by patients or parents are converted to a 5-point Likert scale (very bad (score 1-20), bad (score 21-40), neutral (score 41-60), good (score 61-80) or very good (score 81-100)[2]. Picture responses were scored between 1 and 5 for each item, and a correction factor was used according to the original study's scoring. The result of the Celiac Disease Dutch Questionnaire will form the dependent variable.

3.2.3. The Pediatric Quality of Life Inventory (PedsQL)

This QoL scale developed in 1999 by Varni et al.[76]. It is derived from the 32-item Pediatric Cancer Quality of Life Inventory developed by Varni et al in 1998[77]. PedsQL 1.0 was developed first, followed by PedsQL 2.0, PedsQL 3.0 and PedsQL 4.0 respectively[77–79]. QoL Scale for children consists 7 self-report forms, including forms for parents who has children and their age 2–4, 5–7, 8–12, 13–18 and self-report forms for children or for teenagers and their age 5–7, 8–12, 13–18. Although adolescent and child forms are similar to each other, simpler words are used in child forms due to the difference in cognitive development levels of children and adolescents[76]. The Turkish validity and reliability of the 8-12 year old child form of the QoL scale for children was performed by Memik et al. in 2008[80]. The Turkish validity and reliability of the 13-18 year old child form of this QoL scale in children was performed by the same group in 2007[81]. **(Appendix 7.5.3.)**.

The scale questions the last month of children and adolescents. It was developed as a 5-choice Likert-type scale for children whose age is 8–18 years. Items' scores are between 0-100. The total score is provided after the scores of the answered questions are summed up and divided by the number of filled items. If more than 50% of the scale is not filled in, the scale is not taken into consideration. Higher PedsQL score indicates better HRQoL. PedsQL includes 23 items. It is questioned the areas of physical state, emotional functionality, and social functionality, which are the characteristics of the state of health defined by the WHO. In addition, school functionality is also questioned. There are 3 score at the end of the questionnaire. One is total score of the questionnaire, other is the total score of physical health, and the last one is the total score of psychosocial health.

Cronbach's alpha coefficient of PedsQL, evaluated and found to be 0.93. The result of the PedsQL Questionnaire formed the dependent variable.

3.3. Turkish Version of the CDDUX

First of all, to precede the Turkish version of CDDUX Questionnaire (in August 2020), a written permission was obtained from M.Luisa Mearin the competent producer of the original scale through e-mail **(Appendix 7.4.1.)** and permission to use the PedsQL (in October 2020) was obtained from the developers through e-mail **(Appendix 7.4.2.)**

3.3.1. Turkish Adaptation Protocol

For the translation process used a standardized protocol recommended by Brislin (1986)[82]. Questionnaire was translated from English to the Turkish by a bilingual researcher to provide the Turkish language validity of the CDDUX Questionnaire[83]. The translated questionnaire was back translated by an uninformed researcher. The back translated version was

then compared with the original English version and tested for inconsistencies, errors, biases, and incongruences. No inconsistency was observed. The versions were the same like suggested by Bracken et al. (1991)[84]. The Turkish version of the CDDUX is shown in the **(Appendix 7.5.2.).**

3.3.2. Cultural Adaptation

After the validation, 30 volunteers answered the pilot study to warrant the be clear and appropriate for the Turkish version of the tool. Volunteers found the questionnaire easy to answer. This final CDDUX Questionnaire version was ready to use for the study of validity and reliability.

3.4. Validity, Reliability and Data Analysis

After the language translation and cultural adaptation of the CDDUX was provided, the reliability was tested by Cronbach's alpha which values between 0-1 and it shows that the reliability increases as it gets closer to 1[85]. Sample concordance was tested by the Kaiser–Meyer–Olkin and Bartlett's tests for factor analyses. Bartlett's test was performed for the data set's concordance for the analysis of factors. Principal Components Factor Analysis was calculated to examine the scale's factor structure. The components with an eigenvalue greater than 1 were detected to determine the number of factors.

Afterwards, the quantitative data taken from the study is given with mean, standard deviation, lower and upper values. Compliance of the data obtained with normal distribution was checked with Kolmogrov Smirnov test. While 2-group comparison of normally distributed data (parametric) calculated by Student's t Test, for 3 or more groups ANOVA was used. Mann Whitney U test is used in the comparison of the data of two groups that do not provide the normal distribution (non-parametric), and the Kruskall Wallis test in those of 3 or more groups. Qualitative data is showed with frequency and percentage values and Chi-square test is used for their assessment. All descriptive data for the CDDUX and PedsQL were given for overall sample by mean ± standart deviation (SD)

Statistical analyses were performed by using the IBM SPSS 22.0. Confidence interval of 95% was applied in all tests. The statistical significance level was accepted as $p< 0.05$.

4. RESULTS

4.1. Translation

The semantically equivalent of the translations and the consensus among the translators in the development of the translation ensured that these steps were completed satisfactorily. **(Appendix 7.5.2.)**. The back-translation showed good similarity to the original questionnaire. No facial expressions that required adaptation or words that were not suitable for the local culture were found.

4.2. Validity and Reliability Analysis of the CDDUX

The confirmation of the psychometric properties of the tool suitable to the measurement equivalence, focusing on the dimensional validity evaluation, adequacy of items, and the tool's internal consistency.

4.2.1. Reliability Analyses of CDDUX Questionnaire for Children

The alpha coefficient was carried out to determine the internal consistency reliability for every item in CDDUX Questionnaire for children. These values are shown in Table 4.1. The reliability is high for every item (>0.70) (Table 4.2.)

Table 4.1. Reliability Statistics of CDDUX-Children

	Statistics for Reliability	
	Cronbach's Alpha	n of Items
CDDUX Children	0.867	12

Table 4.2. Reliability Statistics for All Items (Children CDDUX)

Total Item Statistics

CDDUX Children Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha If Item Deleted
1	23.945	67.776	0.448	0.863
2	24.397	70.655	0.288	0.872
3	23.329	63.519	0.553	0.857
4	24.788	69.824	0.482	0.861
5	24.411	68.464	0.458	0.862
6	23.740	61.697	0.650	0.849
7	23.493	62.348	0.602	0.853
8	24.603	64.476	0.654	0.850
9	24.205	63.861	0.611	0.852
10	24.568	65.144	0.678	0.849
11	24.849	68.887	0.567	0.857
12	24.116	62.269	0.666	0.848

4.2.2. Reliability of the CDDUX Questionnaire for Parents

The alpha coefficient was carried out to determine the internal consistency reliability for every item in CDDUX Questionnaire for parents. These values are shown in the Table 4.3. The reliability is high for every item (>0.70) (Table 4.4)

Table 4.3. Reliability Statistics of CDDUX-Parents

Reliability Statistics

	Cronbach's Alpha	n of Items
CDDUX Parents	0.890	12

Table 4.4. Reliability Statistics for All Items (Parents CDDUX)

Total Items Statistics				
CDDUX Parent Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha If Item Deleted
1	21.671	57.174	0.508	0.886
2	21.753	58.118	0.446	0.889
3	21.089	52.964	0.614	0.881
4	22.130	58.473	0.638	0.881
5	21.856	57.324	0.540	0.884
6	21.260	51.642	0.719	0.874
7	21.130	51.893	0.674	0.877
8	22.082	56.807	0.650	0.879
9	21.856	55.283	0.650	0.878
10	22.021	57.896	0.582	0.882
11	22.219	58.021	0.678	0.880
12	21.767	54.732	0.602	0.881

4.2.3. Reliability of the CDDUX Questionnaire Both for Children and Parents

The internal consistency of CDDUX and correlation between the children' questionnaire and parents' questionnaire were tested. The alpha coefficient was carried out to determine the internal consistency reliability for every item in CDDUX Questionnaire both for parents and children. The Cronbach's α showed a high internal consistency for the overall CDDUX (>0.70). The Cronbach alpha values are shown in Table 4.5 and 4.6.

Table 4.5. Reliability Statistics of CDDUX-Children and Parents

Reliability Statistics		
	Cronbach's Alpha	n of Items
CDDUX Children+Parents	0.934	24

Table 4.6. Reliability Statistics for All Items (Children and Parents CDDUX)

Total Item Statistics

CDDUX	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Children 1	90.384	249.107	0.457	0.933
Children 2	89.932	255.319	0.280	0.936
Children 3	90.979	241.069	0.558	0.932
Children 4	89.521	251.713	0.546	0.932
Children 5	89.918	250.035	0.476	0.933
Children 6	90.589	236.423	0.681	0.930
Children 7	90.836	239.007	0.604	0.931
Children 8	89.726	242.090	0.676	0.930
Children 9	90.123	241.116	0.630	0.931
Children 10	89.760	242.997	0.710	0.930
Children 11	89.479	249.741	0.621	0.931
Children 12	90.212	237.810	0.689	0.930
Parents 1	89.966	248.530	0.543	0.932
Parents 2	89.884	251.248	0.457	0.933
Parents 3	90.548	239.891	0.642	0.930
Parents 4	89.507	251.852	0.637	0.931
Parents 5	89.781	249.496	0.550	0.932
Parents 6	90.377	237.533	0.728	0.929
Parents 7	90.507	236.403	0.731	0.929
Parents 8	89.555	248.566	0.647	0.931
Parents 9	89.781	244.876	0.668	0.930
Parents 10	89.616	250.942	0.576	0.932
Parents 11	89.418	251.307	0.658	0.931
Parents 12	89.870	245.079	0.584	0.931

4.2.4. Validity of the CDDUX Questionnaire for Children

At the measurement equivalence phase, sample adequacy was evaluated by Kaiser-Meyer-Olkin (KMO) index. KMO value is found 0.861 for children and 0.872 for parents which is accepted with values >0.50. The Bartlett Test of Sphericity, which is accepted as an indicator of multivariate normality, was examined. Bartlett's test of sphericity was used to warrant whether the correlation matrix was an identity matrix, and the value was significantly meaningful ($p<0.001$). Consequently, it is accepted that the data was ready for factor analysis. It is shown in Table 4.7, and every item were attended for the exploratory factor analysis.

Table 4.7. Test for Sample Adequacy

KMO and Bartlett's Test		Children	Parents
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.861	0.872
Bartlett's Test of Sphericity	Approx.Chi-Square	803.121	1048.152
	Df	66	66
	Sig.	0.000	0.000

An exploratory factor analysis was maintained by principal component analysis /promax rotation to provide the factor loading of every item of the scale. Eigenvalues ≥ 1.0 were accepted.

The factor analysis results showed that there are three factors which eigenvalue is higher than 1. The effect of these components on the total variance was found to be 67.51% for CDDUX-C and 73.41% for CDDUX-P (Table 4.8).

Table 4.8. Factor Analysis

	Children				Parents			
	Factor	**Total**	**% of Variance**	**Cumulative %**	**Factor**	**Total**	**% of Variance**	**Cumulative %**
Initial Eigenvalues	1	5.10	42.31	42.31	1	5.67	47.24	47.24
	2	1.68	14.03	56.34	2	1.72	14.35	61.58
	3	1.34	11.17	67.51	3	1.42	11.82	73.41
Extraction Sums of Squared Loadings	1	4.65	38.71	38.71	1	5.17	43.10	43.10
	2	1.25	10.43	49.14	2	1.46	12.12	55.21
	3	0.92	7.62	56.76	3	1.24	10.37	65.58

Extraction Method: Principal Component Analysis. When components are correlated, sums of squared loadings cannot be added to obtain a total variance

The factor pattern and the factor load values of the items according to factor analysis, attained because of excluding these from the analysis are given in Table 4.9.

Table 4.9. Factor pattern of the CDDUX

	Factor Matrix[ab]			Structure Matrix[c]			Pattern Matrix[d]		
	Factor			Factor			Factor		
	1	2	3	1	2	3	1	2	3
Children 1	0.427	0.141	0.381	0.379	0.271	0.552	0.238	-0.043	0.488
Children 2	0.235	0.373	0.429	0.128	0.240	0.608	-0.114	0.062	0.623
Children 3	0.583	0.440	-0.348	0.405	0.805	0.239	-0.016	0.845	-0.080
Children 4	0.524	-0.086	0.227	0.535	0.269	0.374	0.501	-0.089	0.240
Children 5	0.414	0.422	0.514	0.287	0.374	0.779	-0.015	0.094	0.748
Children 6	0.649	0.463	-0.121	0.471	0.790	0.447	0.042	0.705	0.162
Children 7	0.597	0.474	-0.169	0.416	0.774	0.392	-0.013	0.737	0.113
Children 8	0.815	-0.370	0.064	0.891	0.384	0.256	0.961	-0.117	-0.023
Children 9	0.745	-0.251	-0.078	0.782	0.447	0.177	0.779	0.078	-0.116
Children 10	0.803	-0.204	-0.095	0.822	0.523	0.215	0.777	0.151	-0.105
Children 11	0.636	-0.163	0.259	0.666	0.299	0.414	0.660	-0.146	0.248
Children 12	0.759	-0.080	-0.138	0.741	0.574	0.223	0.625	0.279	-0.095
Parents 1	0.499	0.477	-0.241	0.423	0.274	0.724	0.128	-0.041	0.679
Parents 2	0.476	0.530	-0.479	0.302	0.266	0.852	-0.129	0.011	0.908
Parents 3	0.754	-0.415	-0.114	0.464	0.867	0.269	-0.002	0.886	-0.049
Parents 4	0.642	0.222	0.138	0.661	0.453	0.482	0.510	0.097	0.208
Parents 5	0.551	0.469	-0.389	0.392	0.346	0.819	-0.023	0.069	0.805
Parents 6	0.849	-0.334	-0.180	0.531	0.926	0.409	-0.006	0.897	0.089
Parents 7	0.793	-0.329	-0.090	0.531	0.861	0.337	0.077	0.816	0.007
Parents 8	0.663	0.171	0.466	0.824	0.444	0.313	0.868	-0.003	-0.092
Parents 9	0.673	0.154	0.463	0.827	0.461	0.310	0.863	0.021	-0.101
Parents 10	0.585	0.207	0.275	0.675	0.388	0.374	0.635	0.011	0.072
Parents 11	0.651	0.433	0.249	0.777	0.353	0.569	0.728	-0.151	0.282
Parents 12	0.634	0.047	0.403	0.737	0.481	0.246	0.733	0.128	-0.144

Extraction Method: Maximum Likelihood

a.Children. 3 factors extracted. 5 iterations required.

b.Parents. 3 factors extracted 4 iterations required.

c. Rotation Method: Promax with Kaiser Normalization

d. Children. Rotation Method: Promax with Kaiser Normalization. Rotation converged in 6 iterations.

e. Parents. Rotation Method: Promax with Kaiser Normalization. Rotation converged in 5 iterations.

4.3. Descriptive Statistics

In 87% of cases the mother/father filled in the questionnaire (Table 4.10).

Table 4.10. Parents who filled the questionnaire

	n	%
Mother	127	87.0
Father	12	8.2
Other	7	4.8
Total	146	100.0

4.3.1. Sociodemographic Characteristics of Children

When the dispersion of children by sex is assesses in this study, 65.1% of them were girls (n = 95), 34.9% (n = 51) were boys; the mean age calculated as 11.8±3.3 years (min. 8 – max. 18 years). Mean values for number of siblings were 1.5±1.2 (min. 0 – max. 6).

In CD patients, mean age at diagnosis was 7.8±3.7 years (min. 1 – max. 17 years). Mean disease duration of children diagnosed with celiac disease was 48.1±35.8 months (min. 1 – max. 204 months).

When educational level of the children is evaluated in this study; 37% of them were primary school, 32.9% were secondary school, 24.7% were high school students, 5.5% were at higher education. 71.9% of the children were studying at public schools, 27.4% at private schools, 0.7% were not studying. 67.1% of the participants were living in the city, 20.1% in the county, 2.7% in the village.

78.8% of the participants mentioned that their child didn't have additional chronic disease, 21.2% of them had another chronic disease. General characteristics of children are shown in Table 4.11.

Table 4.11. General Characteristics of Children

		n	%
Sex	Women	95	65.1
	Men	51	34.9
Educational Status	Primary school	54	37.0
	Secondary school	48	32.9
	High school	36	24.7
	Higher education	8	5.5
School type	Private school	40	27.4
	non-student	1	0.7
	Public school	105	71.9
Where they lived	Village	4	2.7
	County	44	30.1
	City	98	67.1
Additional disease	No	115	78.8
	Yes	31	21.2
	Total	146	100.0

4.3.2. Sociodemographic Characteristics of Parents

When the general characteristics of the parents are evaluated in this study; mothers' educational degree were found that 13.7% of them were primary school, 11.6% of them were secondary school, 22.6% were high school, 52.1% were higher education graduation level. When we asked the fathers' educational degree, 9.6% of them were primary school, 13.0% of them were secondary school, 26.0% were high school, 51.4% were higher education graduation level. When the marital status of the parents is evaluated; 96.6% of them was married and 3.4% of them was single. Total of 34 children (23.3%) reported a family history for CD. Other general features of the parents shown in Table 4.12.

Table 4.12. General Features of Parents

		n	%
Educational level of mother	Primary school	20	13.7
	Secondary school	17	11.6
	High school	33	22.6
	Higher education	76	52.1
Educational level of father	Primary school	14	9.6
	Secondary school	19	13.0
	High school	38	26.0
	Higher education	75	51.4
Marital status	Married	141	96.6
	Single	5	3.4
Family income	income > expenses	27	18.5
	income = expenses	51	34.9
	income < expenses	68	46.6
Family members With CD	No	112	76.7
	Yes	34	23.3
	Total	146	100.0

4.3.3. The Descriptive Statistics of CDDUX Questionnaire for Children

Total score of the CDDUX for children was 26.40 ± 8.79 (min. 12 – max. 55). Table 4.13 and 4.14 shows the relationship between the demographic and clinical variables with the CDDUX. There was no significant difference between the variables except for the marital status of the parents. Accordingly, the Qol of the children of single parents is significantly higher than that of married parents according to CDDUX-C.

Table 4.13. CDDUX and Associated Factors About Children-1

		n	Min	Max	Mean	Std. Dev.	p
Sex	Women	95	17.50	34.70	26.10	8.6	0.416
	Men	51	18.00	36.40	27.20	9.2	
Additional Disease	No	115	18.80	35.00	26.90	8.1	0.276
	Yes	31	17.00	38.80	27.90	10.9	
Marital Status	Married	141	17.50	34.70	26.10	8.6	0.049*
	Single	5	23.20	44.80	34.00	10.8	
Family History For CD	No	112	17.80	35.40	26.60	8.8	0.711
	Yes	34	17.10	34.70	25.90	8.8	

Independent Sample t-test
** p<0.05*

Table 4.14. CDDUX and Associated Factors About Children-2

		n	Min	Max	Mean	Std. Dev.	p
Child Education Level	Primary school	54	17.40	35.60	26.50	9.1	0.756
	Secondary school	48	17.70	33.30	25.50	7.8	
	High school	36	18.40	36.60	27.50	9.1	
	Higher education	8	13.00	37.20	25.10	12.1	
School Type	Public school	105	17.20	36.60	26.40	9.2	0.255
	Private school	40	19.30	34.30	26.80	7.5	
	Non-student	1	12.00	12.00	12.00	NA	
Children Where They Lived	City	98	17.30	35.30	26.30	9.0	0.868
	Country	44	18.20	35.40	26.80	8.6	
	Village	4	17.00	32.00	24.50	7.5	
Family Income	income < expenses	68	17.60	35.00	26.30	8.7	0.965
	expenses =income	51	16.60	36.00	26.30	9.7	
	income >expenses	27	19.20	34.40	26.80	7.6	
Education Level of Mother	Primary school	20	16.00	32.20	24.10	8.1	0.526
	Secondary school	17	20.20	33.40	26.80	6.6	
	High school	33	16.10	35.30	25.70	9.6	
	Higher education	76	18.10	36.30	27.20	9.1	
Education Level of Father	Primary school	14	18.90	33.30	26.10	7.2	0.877
	Secondary school	19	14.20	39.40	26.80	12.6	
	High school	38	19.10	35.50	27.30	8.2	
	Higher education	75	18.60	35.20	26.90	8.3	

ANOVA

4.3.4. The Descriptive Statistics of CDDUX Questionnaire for Parents

Total score of the CDDUX for parents was 23.7 ± 8.1 (min. 12 – max.). Parents evaluated their children's QoL as significantly lower than the children's self-evaluation ($p < 0.01$).

Table 4.15 and 4.16 shows the relationship the demographic and clinical variables with the CDDUX. There was no significant difference between the variables ($p<0.05$).

Table 4.15. CDDUX and Associated Factors About Parents-1

		n	Min	Max	Mean	Std. Dev.	p
Sex	Women	95	15.40	31.40	23.40	8.0	0.514
	Men	51	16.00	32.60	24.30	8.3	
Additional Disease	No	115	15.50	31.10	23.30	7.8	0.214
	Yes	31	16.00	34.60	25.30	9.3	
Marital Status	Married	141	15.50	31.30	23.40	7.9	0.100
	Single	5	23.70	41.90	32.80	9.1	
Family History For CD	No	112	15.60	31.80	23.70	8.1	0.958
	Yes	34	15.40	31.80	23.60	8.2	

Independent Sample t-test

Table 4.16. CDDUX and Associated Factors About Parents-2

		n	Min	Max	Mean	Std. Dev.	p
Child Education Level	Primary school	54	15.80	32.40	24.10	8.3	0.749
	Secondary school	48	15.50	29.90	22.70	7.2	
	High school	36	16.20	32.80	24.50	8.3	
	Higher education	8	11.80	35.00	23.40	11.6	
School Type	Public school	105	15.10	31.30	23.20	8.1	0.135
	Private school	40	17.30	25.30	25.30	8.0	
	Non-student	1	12.00	12.00	12.00	NA	
Children Where They Lived	City	98	17.30	35.30	26.30	9.0	0.537
	Country	44	18.20	35.40	26.80	8.6	
	Village	4	17.00	32.00	24.50	7.5	
Family Income	income < expenses	68	15.60	32.00	23.80	8.2	0.992
	expenses =income	51	14.90	32.30	23.60	8.7	
	income >expenses	27	16.70	30.70	23.70	7.0	
Education Level of Mother	Primary school	20	13.90	26.70	20.30	6.4	0.182
	Secondary school	17	16.30	30.70	23.50	7.2	
	High school	33	14.10	32.90	23.50	9.4	
	Higher education	76	16.70	32.70	24.70	8.0	
Education Level of Father	Primary school	14	14.10	28.90	21.50	7.4	0.663
	Secondary school	19	12.90	36.10	24.50	11.6	
	High school	38	16.80	32.20	24.50	7.7	
	Higher education	75	16.00	31.00	23.50	7.5	

ANOVA

4.3.5. The Descriptive Statistics of PedsQL for Children

The descriptive statistics of PedsQL for children were given in Table 4.17. Total score of the PedsQL for children was 74.61 ± 14.92 (min. 31.5 – max. 98.9).

Table 4.17. Descriptive Statistics of PedsQL (Children)

	PedsQL(Children)				
	n	Min	Max	Mean	Std.Dev.
Total Score	146	31.5	98.9	74.61	14.92
Physical Health Summary Score	146	15.6	100.0	74.34	19.50
Psychosocial Health Summary Score	146	16.7	100.0	76.76	15.06

Table 4.18 and 4.19 shows the relationship the demographic and clinical variables with the PedsQL. Two parameters which seems to affect statistically significant QoL for the children were family income and education level of mother. Both children and parents with more family income than their expenses stated that their QoL was better than those who were equal (0.003). Both child and parent PedsQL scores of children whose mothers had secondary or high school education were significantly higher by both children and parents. These results were statistically significant ($p<0.05$).

Table 4.18. PedsQL and Associated Factors About Children-1

		n	Min	Max	Mean	Std. Dev.	p
Sex	Women	95	34.8	98.9	74.15	14.46	0.612
	Men	51	31.5	97.8	75.47	15.86	
Additional Disease	No	115	34.8	98.9	75.43	14.68	0.202
	Yes	31	31.5	94.6	71.57	15.64	
Marital Status	Married	141	31.5	98.9	74.32	15.03	0.216
	Single	5	73.5	94.6	82.74	8.98	
Family History for CD	No	112	34.8	98.9	74.43	14.39	0.795
	Yes	34	31.5	97.8	75.19	16.78	

Independent Sample t-test

Table 4.19. PedsQL and Associated Factors About Children-2

		n	Min	Max	Mean	Std. Dev.	P
Child Education Level	Primary school	54	43.5	98.9	77.29	12.84	0.360
	Secondary school	48	31.5	97.8	74.00	16.04	
	High school	36	34.8	97.8	72.21	15.35	
	Higher education	8	37.0	97.8	70.95	18.84	
School Type	Public school	105	31.5	98.9	73.06	15.43	0.114
	Private school	40	50.00	97.8	78.79	12.97	
	Non-student	1	70.7	70.7	70.65		
Children Where They Lived	City	98	31.5	97.8	75.71	14.11	0.190
	County	44	37.0	98.9	73.21	16.79	
	Village	4	57.6	70.7	63.04	6.08	
Family Income	income <expenses	68	46.7	98.9	76.32	13.33	0.003*
	income= expenses[a]	51	31.5	97.8	69.35	16.56	
	income> expenses	27	47.8	97.8	80.23	12.72	
Education Level of Mother	Primary school[b,c]	20	34.8	85.9	60.92	14.31	0.000*
	Secondary school	17	47.8	97.8	73.12	15.44	
	High school	33	40.2	97.8	76.20	16.02	
	Higher education	76	31.5	98.9	77.86	12.49	
Education Level of Father	Primary school	14	43.5	97.8	66.22	16.25	0.134
	Secondary school	19	34.8	97.8	72.23	16.99	
	High school	38	37.0	96.7	75.97	14.22	
	Higher education	75	31.5	98.9	76.09	14.17	

ANOVA
[a] the difference is significant between income > expenses and income=expenses
[b] the difference is significant between primary school and high school
[c] the difference is significant between primary school and higher education
p<0.05

4.3.6. The Descriptive Statistics of PedsQL for Parents

The descriptive Statistics of PedsQL for parents were given in Table 4.20. Total score of the PedsQL for parents was 75.51 ± 16.79 (min. 19.6 – max. 100). Parents found their children's QoL slightly higher than their children.

Table 4.20. Descriptive Statistics of PedsQL (Parents)

	PedsQL(Parents)				
	n	Min	Max	Mean	Std.Dev.
Total Score	146	19.6	100.0	75.51	16.79
Physical Health Summary Score	146	0.0	100.0	74.28	21.50
Psychosocial Health Summary Score	146	13.3	100.0	76.16	16.78

Table 4.21 and 4.22 shows the relationship the demographic and clinical variables with the PedsQL. Two parameters which seems to affect statistically significant QoL for the parents were family income and education level of mother.

Table 4.21. PedsQL and Associated Factors About Parents-1

		n	Min	Max	Mean	Std. Dev.	p
Sex	Women	95	19.6	100.0	75.50	15.80	0.993
	Men	51	20.7	100.0	75.52	18.65	
Additional	No	115	19.6	100.0	75.86	17.38	0.626
Disease	Yes	31	38.0	98.9	74.20	14.56	
Marital	Married	141	20.7	100.0	75.75	16.33	0.349
Status	Single	5	19.6	91.3	68.56	28.57	
Family	No	112	19.6	100.0	75.16	16.90	0.648
History For	Yes	34	39.1	100.0	76.66	16.59	
CD							

Independent Sample t-test

Table 4.22. PedsQL and Associated Factors About Parents-2

		n	Min	Max	Mean	Std. Dev.	P
Child Education Level	Primary school	54	38.0	100.0	79.73	15.13	0.103
	Secondary school	48	38.0	100.0	74.47	16.53	
	High school	36	19.6	100.0	71.62	18.71	
	Higher education	8	43.5	100.0	70.76	16.46	
School Type	Public school	105	19.6	100.0	73.69	17.63	0.099
	Private school	40	54.3	100.0	80.36	13.62	
	Non-student	1	71.7	71.7	71.73		
Children Where They Lived	City	98	20.7	100.0	73.69	17.63	0.354
	County	44	19.6	100.0	74.37	19.77	
	Village	4	63.0	67.4	64.94	1.85	
Family Income	Income<Expenses	68	20.7	100.0	78.74	15.73	0.000*
	Income=Expenses [a,b]	51	19.6	97.8	67.94	17.31	
	Income>Expenses	27	54.3	100.0	81.65	13.38	
Education Level of Mother	Primary school[c,d]	20	20.7	80.4	58.91	15.10	0.000*
	Secondary school	17	19.6	100.0	73.20	22.33	
	High school	33	38.0	100.0	77.76	15.96	
	Higher education	76	39.1	100.0	79.41	13.41	
Education Level of Father	Primary school	14	38.0	100.0	66.24	17.28	0.149
	Secondary school	19	38.0	97.8	74.53	16.83	
	High school	38	19.6	100.0	75.58	18.97	
	Higher education	75	38.0	100.0	77.45	15.18	

ANOVA

[a] the difference is significant between income=expenses and income < expenses

[b] the difference is significant between income=expenses and income > expenses

[c] the difference is significant between primary school and high school

[d] the difference is significant between primary school and higher education

p<0.05

4.4. CDDUX Classification

CDDUX total score classification and classification according to the age, siblings, diagnosis age, disease duration and PedsQL are shown in the tables below (Table 4.23). In the plot of categorized CDDUX scores and total PedsQL scores for children showed no difference.

Table 4.23. CDDUX Classification

Parameter	Score	n	Min-Max	Mean±Std.Dev.	p
Children Age	0-20	40	8.0-18.0	11.80±3.50	0.883
	21-40	97	8.0-18.0	11.80±3.18	
	41-60	9	8.0-18.0	12.44±3.90	
Siblings	0-20	40	0.0-6.0	1.37±1.25	0.279
	21-40	97	0.0-6.0	1.64±1.19	
	41-60	9	0.0-3.0	1.44±1.23	
Diagnosis Age	0-20	40	1.0-15.0	7.72±3.30	0.838
	21-40	97	2.0-17.0	7.87±3.86	
	41-60	9	2.0-15.0	8.55±4.92	
Disease Duration	0-20	40	0.1-17.0	4.05±3.65	0.760
	21-40	97	0.1-14.0	4.00±2.76	
	41-60	9	1.0-8.0	33.88±2.14	
PedsQL Children	0-20	40	31.5-97.8	71.79±16.25	0.167
	21-40	97	40.2-98.9	75.12±14.48	
	41-60	9	65.2-96.7	81.71±11.43	
PedsQL Parents	0-20	40	20.7-100.0	72.39±16.83	0.327
	21-40	97	19.6-100.0	76.39±17.02	
	41-60	9	53.3-96.7	79.88±13.05	
Total	100	146			

p value calculated via Independent Sample t-test

4.5. Correlations Between CDDUX and PedsQL

4.5.1. Correlations Between CDDUX and PedsQL for Children

The results showed a weak positive significant correlation between the CDDUX and PedsQL on children's QoL ($r=0.265$, $p<0.01$) (Table 4.24)

Table 4.24. Pearson's correlation coefficient between the items of the translated version of CDDUX and PedsQL (Children)

		CDDUX-C Total Score	PedsQL-C Total Score	PedsQL-C Physical Health Summary Score	PedsQL-C Psychosocial Health Summary Score
CDDUX-C Total Score	Correlation Coefficient	1	0.265**	0.188*	0.272**
	Sig. (2-Tailed)		0.001	0.023	0.001
PedsQL-C Total Score	Correlation Coefficient	0.265**	1	0.851**	0.932**
	Sig. (2-Tailed)	0.001		0.000	0.000
PedsQL-C Physical Health Summary Score	Correlation Coefficient	0.188*	0.851**	1	0.602**
	Sig. (2-Tailed)	0.023	0.000		0.000
PedsQL-C Psychosocial Health Summary Score	Correlation Coefficient	0.272**	0.932**	0.602**	1
	Sig. (2-Tailed)	0.001	0.000	0.000	
	n	146	146	146	146

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed

4.5.2. Correlations Between CDDUX and PedsQL for Parents

The results showed a weak positive significant correlation between the CDDUX and PedsQL questionnaire on parents' QoL(r=0.221, p=0.007) (Table 4.25).

Table 4.25. Pearson's correlation coefficient between the items of the translated version of CDDUX and PedsQL (Parents)

		CDDUX-P Total Score	PedsQL-P Total Score	PedsQL-P Physical Health Summary Score	PedsQL-P Psychosocial Health Summary Score
CDDUX-P Total Score	Correlation Coefficient	1	0.221**	0.147	0.238**
	Sig. (2-Tailed)		0.007	0.077	0.004
PedsQL-C Total Score	Correlation Coefficient	0.221**	1	0.868**	0.941**
	Sig. (2-Tailed)	0.007		0.000	0.000
PedsQL-C Physical Health Summary Score	Correlation Coefficient	0.147	0.868**	1	0.648**
	Sig. (2-Tailed)	0.077	0.000		0.000
PedsQL-C Psychosocial Health Summary Score	Correlation Coefficient	0.238**	0.941**	0.648**	1
	Sig. (2-Tailed)	0.004	0.000	0.000	
	n	146	146	146	146

**. Correlation is significant at the 0.01 level (2-tailed).

4.5.3. Correlations Between CDDUX and PedsQL and Other Parameters

To assess the consensus between children and parents thoughts about HRQoL, CDDUX questionnaires were compared between the two of them. The results showed a positive and

statistically significant correlation between the children and parents CDDUX questionnaires (r=865, p<0.001). There was no significant correlation between the other parameters (Table 4.26).

Table 4.26. Correlations Between CDDUX and PedsQL and Other Parameters

		CDDUX-C Total Score	CDDUX-P Total Score
CDDUX-C Total Score	Correlation Coefficient[a]	1.000	0.865*
	p		<0.001*
CDDUX-P Total Score	Correlation Coefficient[a]	0.865*	1.000
	p	<0.001*	
Child Age	Correlation Coefficient[b]	0.042	0.023
	p	0.618	0.783
Siblings	Correlation Coefficient[b]	0.132	0.036
	p	0.113	0.665
Diagnosis Age	Correlation Coefficient[a]	0.032	0.024
	P	0.700	0.775
Disease Duration (years)	Correlation Coefficient[b]	0.068	0.070
	p	0.416	0.399

a.Pearson's correlation
b.Spearman's rho
**p<0.001*

5. DISCUSSION AND CONCLUSION

It is generally accepted that biological, psychological, and social factors affecting the QoL and either diseases or health are the result of an interaction between these factors[86,87]. Although it is known that having a chronic disease may reduce the QoL in children, also strict GFD which is the only treatment for CD can affect the QoL[2,4,88]. In addition, quality of life can affect adherence to a gluten-free diet[4].

In the last years, the HRQoL in patients with CD has taken attention in both medical research and practice and has been one of the main objectives to be considered in the management of patients[3,88]. HRQoL is well indicator an outcome of the health which is reported by patient with chronic diseases[1]. WHO describes QoL as a people's perception of their place[89]. In chronic diseases, quality of life measurement provides additional information for decision-making in clinical practice and is useful in detecting conditions that may remain hidden and provides insight into recommendations for improving adherence to treatment[8].

HRQoL can be assessed by many instruments like generic, disease generic, or disease specific. The tools which are specific to diseases have been stands out for their specific features[2]**.** It is also stated in the guidelines that disease-specific guidelines should be used[3].

CDDUX is a disease specific QoL scale developed for this purpose, namely, to determine the QoL of children with celiac disease. It was a valid and reliable index which has been already adapted and used in many languages like English, Spanish, Italian, Dutch, Arabic, Portuguese, Argentine[2,4–8,10]. This scale has been recommended by authorities and a referred as short and easy to use instrument. Also, providing the answers to the questions in the CDDUX questionnaire through a face diagram facilitates its implementation and cultural adaptation[5].

Cross-cultural adaptation, using a multi-step process, was carried out satisfactorily. We found good psychometric performances in Turkish version of CDDUX. It is shown to be valid and reliable instrument.

Reliability was tested by using Cronbach Alpha values that refer to the internal consistency of the tool. It is showed high or excellent internal consistency both for the children and their parents (Cronbach's Alpha Scores:0.86 (children), 0.89 (parents)), similarly to the original tool, respectively (Cronbach's Alpha Scores 0.88 (children), 0.88 (parents))[2]. Regarding the factorial analysis, all questions showed an item value >0.70. No problematic item was observed in item-scale correlations and alpha values obtained when item was removed. The result of the original study confirms that CDDUX Turkish version is reliable. It was also observed in the 2 studies that evaluated the performance of CDDUX in children from Brazil,

Italy, Spain, Morocco respectively (0.88/0.93(C/P), 0.81(T), 0.88/0.90 (C/P), 0.81/0.78 (C/P))[4,5,7,10]. Recently we found a preprint article which is not peer reviewed that also evaluated the Turkish version of CDDUX with the use of KINDL questionnaire for convergent validity. Cronbach Alpha values were found to be 0.69, in their study[90].

Confirmed by KMO value is found 0.861 for children and 0.872 for parents. These results can be qualified as "excellent" and interpreted as the datasets have sufficient sizes to perform exploratory factor analysis (EFA) [91]. The Bartlett Test of Sphericity, which tests the suitability of the data for a multivariate normal distribution, is a chi-square (χ^2) statistic and if the significance level obtained as a result of this test is below 0.05, it is concluded that the correlation matrix of the data set is different from the unit matrix[91]. The Bartlett Sphericity Test results calculated in our data set are less than 0.05 and met the necessary condition for applying exploratory factor analysis. It was determined that it was a total of 3 factors scale. The variance value was found to be 67.51 for children and 73.41 for parents (>50%). The most important factor affecting the reproducibility of exploratory factor analysis is accepted sample size. The generally accepted sample size in predictive statistics is a minimum of 10 participants for each group or variable[92,93]. Along with the number of items, the number of predicted parameters is also very important in EFA for the replicable result[92].

A generic QoL instrument, PedsQL scale was used for testing the convergent validity of the Turkish CDDUX. The total score which mentioned for the CDDUX was compared with the PedsQL, showed statistically weak positive significant correlation with both forms of CDDUX (child and parent). This difference explains the significance of assessing by a disease specific instrument instead of generic instrument. Disease-specific instruments differ from generic QoL instruments in that information from a disease-specific questionnaire reveals aspects that are affected by this disease. Generic QoL instruments may fail to detect specific aspects of daily life about childrens' and parents' thoughts and experience during a lifelong GFD. These results were also supported by the original scale of CDDUX[2]. They also made the CDDUX correlation with a general HRQoL tool called DUX25[2].

Known groups validity analyses were also conducted to check the construct validity of the Turkish version of CDDUX as another method. We found that the child and parent forms of CDDUX showed a statistically significant positive correlation. Although patients and their parents mentioned similar scores for CDDUX, parents reported their childrens' QoL slightly lower than their children. Determining parents' thoughts about their kids' QoL is important as it can affect illness management for their children[94]. In general, parents are seen as unreliable responders in QoL studies[5,94]. But in our study although parents had lower final score than

children their total CDDUX scores showed significantly positive correlation. This result is valuable. Rojas et al found higher scores for parents but this result is not significant[9]. In some studies, authors mentioned that the parents showed their kid's QoL significantly lower(<0.05)[2,5,6]. In other two study, it is not found any correlation between children' and parents' scores (p>0.05)[4,7].

It is statistically showed that the only factor indicates having a worse HRQoL in CDDUX was marital status of parents. The Qol of the children of single parents is significantly higher than that of married parents according to CDDUX-C. We couldn't find any results about marital status of parents, in literature with CDDUX.

The remaining variables in known groups validity analyses were not related to the scale scores of the CDDUX either for children or parents (gender, educational level of children or their parents, school type, where they lived, child age, number of siblings, diagnosis age, disease duration, family income, family members with CD). These results were also supported by Crocco's study, and they also mentioned that these parameters (gender, age, disease duration, family history with CD) did not affect the total CDDUX score[4]. Both in our study and in Crocco's study, different age groups were classified in terms of QoL[4,9]. Evaluating them in this way makes these results more valuable as they may have different characteristics. In literature, any differences were mentioned in the total score of the translated version of CDDUX according to patient gender, age, disease duration[5,7,9]. Barrio found that significantly better scores were observed the children whose age younger than 2 years old when diagnosed than who had the disease more than 8 years. It is not possible to compare the results of those who were diagnosed at a lower age because the participants in our study were between the ages of 8-18 and the duration of diagnosis was different.

The results of the CDDUX indicate that, parents and children classified final score of QoL in the bad score range (20-40). The mean scores obtained in our study are lower (children: 26±8, parent 23±8) than the scores of the original study (children:44±15, parent 39±15) for both children and parents and also than Lins (children:57±12, parent 45±10), Taghdir (children:30±17, parent 25±14), Rojas (children:66±15, parent 67±16), Barrio (children:55±12, parent 54±12), Pico (children:64±14, parent 56±14), Crocco (children: 52.6 ± 17.2, parent 49.5± 17.9), Günay (36.27±21.03) [2,4–9,90].

Any statistically significant difference was found between the age of the child, the number of siblings, the diagnosis age, and the duration of the disease when the scores of the individuals from CDDUX were categorized and compared. Also, the plot of categorized CDDUX scores and total PedsQL scores for children was not statistically significant.

The results of the PedsQL final score for children is 74±14, for parents is 75±16. It is lower than Crocco's study[4]. Statistical analysis showed that there is some difference with related factors for QoL. One of them is family income. Both children and parents with more family income than their expenses stated that their QoL was better than those who were and those with less than those who were equal. The other is education level of parents. Both child and parent PedsQL scores of children whose mothers had secondary or high school education were significantly higher by both children and parents. The remaining variables was not differed. A total score of 65.2 in QoL measured by the PedsQL scale was determined in 45 children with CD who were 8-14 age in Turkey[95]. In another study conducted in our country with PedsQL scale in 40 children with CD, the total score was found to be 80 for both the 8-12 and the 13-18 age group[73]. There was a control group in both studies, and it was reported that the QoL of children with CD was lower than the control group. A similar results was reported in other studies[96,97]. However, the results of our study suggest that it is appropriate to use disease specific QoL, which supports the literature, despite the results that may be falsely high.

Since the study was conducted on a sample from the two associations which are in two major cities of the country with a high educational status. Because it is a homogeneous group, it may not be a representative sample for the general Turkish population. Other studies with different samples are recommended.

The limitation of our study are that there was no test-retest, the online questionnaire method was used, there was not any healthy control group, and the diagnosis of CD was based on self-report and the individuals were included in the study accordingly. In conclusion, The Turkish version of the CDDUX is an acceptable, valid, and reliable instrument for the assessment of QoL in children with CD. We would like to point out that the Turkish version of the CDDUX showed similar reliable coefficiency compared to the original study. It is a practical tool that can be applied quickly and easily.

It is strongly recommended that HRQoL should be routinely checked in the follow up of patients with CD. This biopsychosocial perspective is thought to be very important in the follow-up of chronic disease especially in primary medicine. Studies with larger representative populations are needed to better understand the effect of CD on QoL in Turkish children and adolescents.

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2015;61(3):303-306. doi:10.1097/MPG.0000000000000799

7. APPENDIX

7.1. Preliminary Petition Forms

7.1.1. Celiac Association

15.12.2020 Gmail - Gözlemsel araştırma kurum izin yazısı

Gmail

Gözlemsel araştırma kurum izin yazısı
2 ileti

30 Kasım 2020 10:13

Sayın Çölyak Derneği Başkanı
Akademik amaçlı yapmayı planladığımız "Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği "isimli gözlemsel araştırmayı dernek üyelerinizde (8-18 yaş çocuk ve ebeveynlerinde) gerçekleştirmek istiyoruz. Dernek aracılığı ile üyelerinize veri toplama formunun ulaştırılması ve gerçekleştirilmesi konusunda iznimizi rica ediyorum.

Saygılarımla,

Sayı : **30/11/2020**
Konu: Gözlemsel araştırma için veri kullanım izni hk.

Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurul Başkanlığına

Yeditepe Üniversitesi, tarafından akademik amaçlı olarak yapılması planlanan "Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği "isimli gözlemsel araştırmanın gerçekleştirilmesinde görev alacak Araştırmacı Dr. Öğretim Üyesi Binnur Okan Bakır ve yardımcı araştırmacı Dr. Nur Ece Öztaş Şükür ile çalışmanın yapılacağı Çölyak Derneği üyelerinin katkılarının sağlanması, anketin üyelerimizle paylaşılması ve yapılacak araştırmanın desteklenmesi tarafımızca uygun görülmüştür.

Gereğini bilgilerinize sunarım.

Çölyak Derneği Başkanı

Dr. Nur Ece Öztaş Şükür

https://mail.google.com/mail/u/1?ik=70af7b29cb&view=pt&search=all&permthid=thread-a%3Ar-7157346595475359438&simpl=msg-a%3Ar-7155694112258675310&simpl=msg-f%3A1684775211374652482 1/3

7.1.2. Celiac Life Associatian

Sayın Çölyakla Yaşam Derneği Başkanı
Akademik amaçlı yapmayı planladığımız "Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği "isimli gözlemsel araştırmayı dernek üyelerinizde (8-18 yaş çocuk ve ebeveynlerinde) gerçekleştirmek istiyoruz. Dernek aracılığı ile üyelerinize veri toplama formunun ulaştırılması ve gerçekleştirilmesi konusunda izninizi rica ediyorum.

Saygılarımla,
--
Dr. Nur Ece Öztaş Şükür
Kocaeli Üniversitesi Tıp Fakültesi Aile Hekimliği Anabilim Dalı

23 Aralık 2020 12:19

Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurul Başkanlığına

Yeditepe Üniversitesi, tarafından akademik amaçlı olarak yapılması planlanan "Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği "isimli gözlemsel araştırmanın gerçekleştirilmesinde görev alacak Araştırmacı Dr. Öğretim Üyesi Binnur Okan Bakır ve yardımcı araştırmacı Dr. Nur Ece Öztaş Şükür ile çalışmanın yapılacağı Çölyak Derneği üyelerinin katkılarının sağlanması, anketin üyelerimizle paylaşılması ve yapılacak araştırmanın desteklenmesi tarafımızca uygun görülmüştür.

Gereğini bilgilerinize sunarım.

Çölyakla Yaşam Derneği Başkanı
Oya Özden

7.2. Informed Consent Form

BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU

Değerli katılımcı; Yeditepe Üniversitesi Beslenme ve Diyetetik Yüksek Lisans Bölümü'nde "Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği "isimli bir bilimsel araştırma çalışması yürütülmektedir. Bu veri toplama formunun amacı çölyak hastalığına sahip olan 8-18 yaş aralığındaki çocukların yaşam kalitesini değerlendirmek için Türk toplumunda kullanılabilir, güvenilir ve geçerli bir anket elde etmektir. Elde edilen bilgiler ile çölyak hastalığına sahip çocukların yaşam kalitelerinin doğru bir şekilde değerlendirilebilmesi amaçlanmaktadır. Online anket yöntemi ile doldurulacak veri toplama formunun tamamlanması ortalama 3-4 dakika sürmektedir. Araştırmaya 8-18 yaş aralığında tahmini 130 kişi ve ebeveynlerinden birinin katılması beklenmektedir. Bu araştırmada size herhangi bir tedavi ya da girişim uygulanmayacaktır. Bu çalışmaya katılmanız sizi hiçbir riskli duruma sokmayacaktır. Bu araştırmaya katılmanızdan dolayı sizden herhangi bir ücret talep edilmeyecek olup, katılmanızdan dolayı da size herhangi bir ödeme yapılmayacaktır. Bu form aracılığıyla elde edilecek gönüllünün kimliğini ortaya çıkaracak kayıtlar gizli tutulacak, kamuoyuna açıklanamayacak; araştırma sonuçlarının yayımlanması halinde dahi gönüllünün kimliği gizli kalacak ve sadece bilimsel amaçla kullanılacaktır. Araştırmaya katılmanız gönüllülük esasına dayanmaktadır. Araştırmaya katılmayı reddedebileceğiniz gibi araştırmaya katıldıktan sonra istediğiniz anda ayrılma hakkına da sahipsiniz. Araştırmadan elde edilen sonuçları talep etmeniz durumunda herhangi bir ücret talep etmeksizin sizlere bildireceğiz. Bu araştırmaya katılımınızla ilgili şimdi veya daha sonra herhangi bir sorunuz veya endişeniz olması

teşekkür ederiz.

Sorumlu Araştırmacı:
Ad- Soyad: Dr. Öğretim Üyesi Binnur Okan Bakır
İmza:
Tarih: 05.05.2021

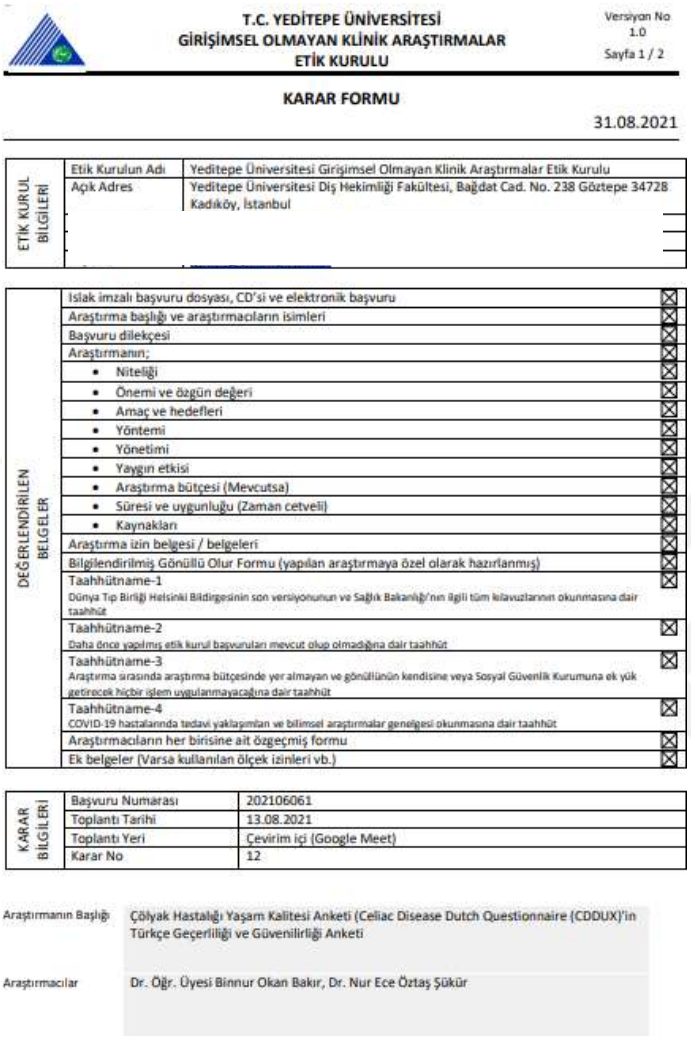
Araştırma Yürütücüsü:
Ad- Soyad: Dr. Nur Ece Öztaş Şükür
İmza:
Tarih: 05.05.2021

"Bilgilendirilmiş gönüllü olur formundaki tüm açıklamaları okudum. Bana yukarıda konusu ve amacı belirtilen araştırma ile ilgili yazılı ve sözlü açıklama aşağıda adı belirtilen hekim tarafından yapıldı. Araştırmaya gönüllü olarak katıldığımı, istediğim zaman gerekçeli veya gerekçesiz olarak araştırmadan ayrılabileceğimi biliyorum. Söz konusu araştırmaya, hiçbir baskı ve zorlama olmaksızın kendi rızamla katılmayı kabul ediyorum. Bu çalışma sonuçlarının kullanılmasını kısıtlamamayı, yayın, rapor ve benzeri bilimsel dokümanlarda kullanılmasını kabul ediyorum. İster doğrudan, ister dolaylı olsun araştırma uygulamasından kaynaklanan nedenlerle meydana gelebilecek herhangi bir sağlık sorunumun ortaya çıkması halinde, her türlü tıbbi müdahalenin sağlanacağı konusunda gerekli güvence verildi."

"Çocuğunuza bu araştırma hakkında anlayacağı şekilde bilgilendirme yapılacak ve araştırmaya katılımı için rızası alınacaktır."

Anne/Baba (Kanuni Temsilci) ad-soyad:	Çocuk ad-soyad:	Tanık ad-soyad:
İmza: Tarih:	İmza: Tarih:	İmza: Tarih:
Adres/Tel no:	Adres/Tel no:	Adres/Tel no:

7.3. Ethical Approval



T.C. YEDİTEPE ÜNİVERSİTESİ
GİRİŞİMSEL OLMAYAN KLİNİK ARAŞTIRMALAR
ETİK KURULU

Versiyon No 1.0
Sayfa 1 / 2

KARAR FORMU

31.08.2021

ETİK KURUL BİLGİLERİ	
Etik Kurulun Adı	Yeditepe Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu
Açık Adres	Yeditepe Üniversitesi Diş Hekimliği Fakültesi, Bağdat Cad. No. 238 Göztepe 34728 Kadıköy, İstanbul

DEĞERLENDİRİLEN BELGELER	
Islak imzalı başvuru dosyası, CD'si ve elektronik başvuru	☒
Araştırma başlığı ve araştırmacıların isimleri	☒
Başvuru dilekçesi	☒
Araştırmanın;	☒
• Niteliği	☒
• Önemi ve özgün değeri	☒
• Amaç ve hedefleri	☒
• Yöntemi	☒
• Yönetimi	☒
• Yaygın etkisi	☒
• Araştırma bütçesi (Mevcutsa)	☒
• Süresi ve uygunluğu (Zaman cetveli)	☒
• Kaynakları	☒
Araştırma izin belgesi / belgeleri	☒
Bilgilendirilmiş Gönüllü Olur Formu (yapılan araştırmaya özel olarak hazırlanmış)	☒
Taahhütname-1 Dünya Tıp Birliği Helsinki Bildirgesinin son versiyonunun ve Sağlık Bakanlığı'nın ilgili tüm kılavuzlarının okunmasına dair taahhüt	☒
Taahhütname-2 Daha önce yapılmış etik kurul başvuruları mevcut olup olmadığına dair taahhüt	☒
Taahhütname-3 Araştırma sırasında araştırma bütçesinde yer almayan ve gönüllünün kendisine veya Sosyal Güvenlik Kurumuna ek yük getirecek hiçbir işlem uygulanmayacağına dair taahhüt	☒
Taahhütname-4 COVID-19 hastalarında tedavi yaklaşımları ve bilimsel araştırmalar genelgesi okunmasına dair taahhüt	☒
Araştırmacıların her birisine ait özgeçmiş formu	☒
Ek belgeler (Varsa kullanılan ölçek izinleri vb.)	☒

KARAR BİLGİLERİ	
Başvuru Numarası	202106061
Toplantı Tarihi	13.08.2021
Toplantı Yeri	Çevirim içi (Google Meet)
Karar No	12

Araştırmanın Başlığı	Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire (CDDUX)'in Türkçe Geçerliliği ve Güvenilirliği Anketi
Araştırmacılar	Dr. Öğr. Üyesi Binnur Okan Bakır, Dr. Nur Ece Öztaş Şükür

BAŞVURU NUMARASI: 202106061

KARAR 31.08.2021

☒ **KABUL**	☐ **RET** ☐ *KAPSAM DIŞI (GİRİŞİMSEL)* ☐ *BİLİMSEL VE/VEYA ETİK KURALLARA AYKIRI* ☐ *BİR SORUMLU ARAŞTIRMACININ (TEZ İSE TEZ DANIŞMANI), BİR TOPLANTIYA* ***İKİ (2)*** ***ADETTEN FAZLA ÇALIŞMA BAŞVURUSUNDA*** *BULUNMASI* ☐ *KURUM İÇİ BAŞVURULARINDA* ***YEDİTEPE UZANTILI E-POSTA HESABI*** *İLE GİRİŞ YAPILMAMIŞ OLMASI* ☐ *ŞARTLI KABULDE BELİRTİLEN REVİZYONLARIN ZAMANINDA VE/VEYA İSTENİLDİĞİ ŞEKİLDE YAPILMAMIŞ OLMASI*

Prof. Dr. Didem ÖZDEMİR ÖZENEN **Başkan**				**Doç. Dr. Gökhan ERTAŞ** **Başkan Yardımcısı**				**Doç. Dr. Elif SUNGURTEKİN EKÇİ** **Raportör**			
Katılım		İlişki		Katılım		İlişki		Katılım		İlişki	
☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok
Prof. Dr. Feryal SUBAŞI **Üye**				**Doç. Dr. Mehmet Engin CELEP** **Üye**				**Dr. Öğr. Üyesi E. Çiğdem KELEŞ** **Üye**			
Katılım		İlişki		Katılım		İlişki		Katılım		İlişki	
☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok
Dr. Öğr. Üyesi Binnur OKAN BAKIR **Üye**				**Dr. Öğr. Üyesi E. Nur ÖZDAMAR** **Üye**				**Dr. Öğr. Üyesi SEVİM ŞEN** **Üye**			
Katılım		İlişki		Katılım		İlişki		Katılım		İlişki	
☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok	☐Var	☐Yok

Araştırmanın Başlığı:	Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire (CDDUX)'in Türkçe Geçerliliği ve Güvenilirliği Anketi
Araştırmacılar	Dr. Öğr. Üyesi Binnur Okan Bakır, Dr. Nur Ece Öztaş Şükür

7.4. Survey Use Permission

7.4.1. CDDUX

15.12.2020 Gmail - CDDUX: a disease-specific health-related quality-of-life questionnaire

Dear Dr. Roesja K van Doorn,
Me and my MSc thesis student Dr. Nur Ece OZTAS SUKUR are interested in studying Turkish reliability and validity of the questionnaire CDDUX.
Thus we kindly ask for your permission to use your instrument.
We would be citing the relevant article and preventing your copyright in every step of our research.

Regards,
--
Dr. Binnur OKAN BAKIR
Yeditepe University
Department of Nutrition and Dietetics

27 Ağustos 2020 16:11

Dear Dr. Binnur OKAN BAKIR,

You may use the CDDUX questionnaire for your research.

As you possibly know the CDDCUX has already been used in many countries.

Wishing you success with your research,

Kind regards,

Luisa

M.Luisa Mearin
Dept. Of Paediatrics
Leiden University Medical Center
PO 9600
2300 RC Leiden
The Netherlands
T: 00.31.71.5262824/5262806
F: 00.31.71.5248198
[Alıntılanan metin gizlendi]

7.4.2. PedsQL

Gmail

Çocuklar İçin Yaşam Kalitesi Ölçeği için izin talebi

2 ileti

30 Kasım 2020 10:28

Değerli Nursu Çakın Memik hocam,

Yeditepe Üniversitesi Beslenme ve Diyetetik yüksek lisans tezimde, hocam Dr. Öğr. üyesi Binnur Okan Bakır ile birlikte "Çölyak Hastalığı Yaşam Kalitesi Anketi (Celiac Disease Dutch Questionnaire [CDDUX])'in Türkçe Güvenilirliği ve Geçerliliği " isimli gözlemsel araştırmanın gerçekleştirilmesinde kullanılmak üzere Türkçe geçerlilik ve güvenilirlik çalışmasını yaptığınız Çocuklar İçin Yaşam Kalitesi Ölçeği'nin 8-12 Yaş Çocuk ve 13-18 Yaş Ergen Formu'nu kullanmak istiyoruz. Her aşamada tüm haklarınızı koruyarak ve refere ederek ölçeği kullanabilmek için izninizi talep ediyoruz.

Saygılarımla,
--
Dr. Nur Ece Öztaş Şükür
Kocaeli Üniversitesi Tıp Fakültesi Aile Hekimliği Anabilim Dalı

30 Kasım 2020 12:04

Ölçeği kullanmanızdan memnuniyet duyarım. İyi çalışmalar dilerim.

Nursu Cakın Memik

[Alıntılanan metin gizlendi]

7.5. The Data Collection

7.5.1. Sociodemographic Form (Survey Part 1)

8-18 yaş Çölyak Hastalığı olan çocuğa ait sosyodemografik form

1. Anketi yanıtlayan ebeveyn:
   - Anne
   - Baba
2. Yaş (Yıl ile):……..
3. Cinsiyet:
   - Kadın
   - Erkek
4. Çocuğun eğitim durumu (Sınıf ile)
   - Okul öncesi (Kreş-Anasınıfı-diğer özel öğretim):
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - Lise Hazırlık
   - 9
   - 10
   - 11
   - 12
   - Üniversite
5. Anne eğitim durumu
   - Okuma-yazma bilmiyor
   - İlkokul mezunu
   - Ortaokul mezunu
   - Lise mezunu
   - Üniversite mezunu
   - Lisans üzeri
6. Baba eğitim durumu
   - Okuma-yazma bilmiyor

- İlkokul mezunu
- Ortaokul mezunu
- Lise mezunu
- Üniversite mezunu
- Lisans üzeri

7. Çocuğun okuduğu okul çeşidi:
   - Devlet okulu
   - Özel okul
   - Diğer
8. Anne-baba medeni durumu
   - Evli
   - Ayrı (Boşanmış ya da ebeveynlerden biri hayatta değil)
9. Çocuğun kardeş sayısı (Sayı ile):……..
10. Çocuğun yaşadığı yer
    - Köy
    - İlçe
    - İl merkezi
11. Ailenin gelir durumu
    - Gelirim giderimden az
    - Gelirim giderime eşit
    - Gelirim giderimden fazla
12. Çocuğun çölyak hastalığı tanısı aldığı yaş (Sayı ile):……..
13. Çocuğun kaç yıldır çölyak hastalığı tanısı var? (Sayı ile): ……..
14. Ailede çölyak hastası olan var mı?
    - Evet
    - Hayır
15. Çocuğun ek kronik hastalık var mı? (Diyabet, tiroid vs.)
    - Evet (Lütfen belirtiniz:……..)
    - Hayır

7.5.2. Coeliac Disease Dutch Questionnaire (CDDUX) (Survey Part 2)

CDDUX ÇOCUK FORMU

Son zamanlarda nasıl hissettiğinizi öğrenmekle ilgileniyoruz. Lütfen aşağıdaki durumlarda nasıl hissettiğinizi işaretleyiniz. Nasıl hissettiğinizi en iyi gösteren yüzü daire içine alınız.
Yanlış cevap yoktur. Önemli olan bununla ilgili nasıl hissettiğinizdir.
Son zamanlarda nasıl hissettiğinizi belirtiniz.

1. Gluten içeren besinleri düşündüğümde, şöyle hissediyorum.....

2. Okulda, bana gluten içeren besin verdiklerinde, bunu şöyle buluyorum.....

3. Çölyak hastalığı ile konuşmayı şöyle buluyorum.....

4. İstediğim herhangi bi şeyi yiyememek, şöyle hissediyorum.....

5. Birisi bana gluten içeren bir besin ikram ettiğinde, şöyle hissediyorum....

6. Başkalarına çölyak hastalığının ne olduğunu anlatmak, bunu şöyle buluyorum.....

7. Benim yaşımdaki diğerleri ile çölyak hastalığı hakkında konuşmak, şöyle hissediyorum....

8. Yaşam boyu bir diyet uygulamak, bunu şöyle buluyorum.....

9. Ne yiyeceğime dikkat etmek zorunda olmak, bunu şöyle buluyorum.....

10. Çölyak hastası olmak.....

11. Diğer insanların yediği tüm şeyleri yiyememek, bunu şöyle buluyorum.....

12. Çölyak hastalığım için bir diyet takip ediyor olmak.....

EDDUX EBEVENYN FORMU

Son zamanlarda oğlunuz/kızınızın nasıl hissettiğini öğrenmekle ilgileniyoruz. Lütfen aşağıdaki durumlarda oğlunuz/kızınızın nasıl hissettiğini işaretleyiniz. Nasıl hissettiğinizi en iyi gösteren yüzü daire içine alınız.

Yanlış cevap yoktur. Önemli olan bununla ilgili nasıl hissettiğinizdir.

Son zamanlarda oğlunuz/kızınızın nasıl hissettiğini belirtiniz.

1. Oğlunuz/kızınız gluten içeren besinleri düşündüğünde, şöyle hisseder.....

2. Okulda, ona gluten içeren besin verdiklerinde, şöyle hisseder.....

3. Çölyak hastalığı ile ilgili başkaları ile konuşmak, şöyle hisseder.....

4. Herhangi bi şeyi yiyememek, şöyle hisseder.....

5. Birisi ona gluten içeren bir besin ikram ettiğinde, şöyle hisseder.....

6. Oğlunuz/kızınız başkalarına çölyak hastalığının ne olduğunu anlatmak zorunda kaldığında, şöyle hisseder.....

7. Onun yaşındaki diğerleri ile çölyak hastalığı hakkında konuştuğunda, şöyle hisseder.....

8. Yaşam boyu bir diyet uygulamak, bunu şöyle bulur.....

9. Ne yiyeceğine dikkat etmek zorunda olmak, şöyle hisseder.....

10. Çölyak hastası olmak.....

11. Diğer insanların yediği tüm şeyleri yiyememek, oğlunuz/kızınız bunu şöyle bulur.....

12. Çölyak hastalığım için bir diyet takip ediyor olmak, oğlunuz/kızınız bunu şöyle bulur.....

7.5.3. The Pediatric Quality of Life Inventory (PedsQL) (Survey Part 3)

Ad Soyad:
Tarih:

ÇOCUKLAR İÇİN YAŞAM KALİTESİ ÖLÇEĞİ

Çocuk Değerlendirme Formu (8-12 yaş)

Bir sonraki sayfada senin için sorun olabilecek durumların listesi bulunmaktadır.
Lütfen son bir aylık süre içinde her birinin senin için ne kadar sorun oluşturduğunu daire içine alarak belirt.

Eğer senin için **hiçbir zaman** sorun değilse	**0**
Eğer senin için **nadiren** sorun oluyorsa	**1**
Eğer senin için **bazen** sorun oluyorsa	**2**
Eğer senin için **sıklıkla** sorun oluyorsa	**3**
Eğer senin için **hemen her zaman** sorun oluyorsa	**4**

Burada yanlış ya da doğru cevaplar yoktur.
Eğer herhangi bir soruyu anlayamazsan lütfen yardım iste.

Son bir ay içinde aşağıdakiler senin için ne kadar sorun yarattı?

Sağlığım ve aktivitelerim ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Bir bloktan fazla yürümek bana zor gelir	0	1	2	3	4
2. Koşmak bana zor gelir	0	1	2	3	4
3. Spor ya da egzersiz yapmak bana zor gelir	0	1	2	3	4
4. Ağır bir şey kaldırmak bana zor gelir	0	1	2	3	4
5. Kendi başıma duş ya da banyo yapmak bana zor gelir	0	1	2	3	4
6. Evdeki günlük işleri yapmak bana zor gelir	0	1	2	3	4
7. Bir yerim acır ya da ağrır	0	1	2	3	4
8. Enerjim azdır	0	1	2	3	4

Duygularımla ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Korkmuş ya da ürkmüş hissederim	0	1	2	3	4
2. Hüzünlü ya da üzgün hissederim	0	1	2	3	4
3. Öfkeli hissederim	0	1	2	3	4
4. Uyumakta zorluk çekerim	0	1	2	3	4
5. Bana ne olacağı konusunda endişelenirim	0	1	2	3	4

Başkaları ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Yaşıtlarımla geçinmekte sorun yaşarım	0	1	2	3	4
2. Yaşıtlarım benimle arkadaş olmak istemezler	0	1	2	3	4
3. Yaşıtlarım benimle alay eder	0	1	2	3	4
4. Yaşıtlarımın yapabildikleri şeyleri yapamam	0	1	2	3	4
5. Yaşıtlarımla oyun oynarken geri kalırım	0	1	2	3	4

Okul ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Sınıfta dikkatimi toplamakta zorlanırım	0	1	2	3	4
2. Bazı şeyleri unuturum	0	1	2	3	4
3. Derslerimden geri kalmamak için zorluk çekerim	0	1	2	3	4
4. Kendimi iyi hissetmediğim için okula gidemediğim olur	0	1	2	3	4
5. Doktora ya da hastaneye gittiğim için okula gidemediğim olur	0	1	2	3	4

Çocuğunuzun adı Soyadı:
Tarih:

ÇOCUKLAR İÇİN YAŞAM KALİTESİ ÖLÇEĞİ

Çocuk Değerlendirme Formu (Anne-Baba) (8-12 yaş)

Bir sonraki sayfada çocuğunuz için sorun olabilecek durumların listesi bulunmaktadır.
Lütfen son bir aylık süre içinde her birinin çocuğunuz için ne kadar sorun oluşturduğunu daire içine alarak belirtiniz.

Eğer çocuğunuz için **hiçbir zaman** sorun değilse	**0**
Eğer çocuğunuz için **nadiren** sorun oluyorsa	**1**
Eğer çocuğunuz için **bazen** sorun oluyorsa	**2**
Eğer çocuğunuz için **sıklıkla** sorun oluyorsa	**3**
Eğer çocuğunuz için **hemen her zaman** sorun oluyorsa	**4**

Burada yanlış ya da doğru cevaplar yoktur.
Eğer herhangi bir soruyu anlayamazsanız lütfen yardım isteyiniz.

Son bir ay içinde aşağıdakiler çocuğunuz için ne kadar sorun yarattı?

Fiziksel işlevsellik ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Bir bloktan fazla yürümek	0	1	2	3	4
2. Koşmak	0	1	2	3	4
3. Spor ya da egzersiz yapmak	0	1	2	3	4
4. Ağır bir şey kaldırmak	0	1	2	3	4
5. Kendi başına duş ya da banyo yapmak	0	1	2	3	4
6. Evdeki günlük işleri yapmak	0	1	2	3	4
7. Acısının ya da ağrısının olması	0	1	2	3	4
8. Düşük enerji düzeyi	0	1	2	3	4

Duygusal işlevsellik ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Korkmuş ya da ürkmüş hissetmek	0	1	2	3	4
2. Hüzünlü ya da üzgün hissetmek	0	1	2	3	4
3. Öfkeli hissetmek	0	1	2	3	4
4. Uyku ile ilgili zorluklar	0	1	2	3	4
5. Kendisine ne olacağı konusunda endişe duymak	0	1	2	3	4

Sosyal işlevsellik ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Yaşıtları ile geçimi	0	1	2	3	4
2. Yaşıtlarının onunla arkadaş olmak istememesi	0	1	2	3	4
3. Yaşıtları tarafından alay edilmesi	0	1	2	3	4
4. Yaşıtlarının yapabildiği şeyleri yapamaması	0	1	2	3	4
5. Yaşıtları ile oyun oynarken geri kalması	0	1	2	3	4

Okul ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Sınıfta dikkatini toplayamaması	0	1	2	3	4
2. Bazı şeyleri unutması	0	1	2	3	4
3. Derslerinden geri kalması	0	1	2	3	4
4. Kendini iyi hissetmediği için okula gidememesi	0	1	2	3	4
5. Doktora ya da hastaneye gittiği için okula gidememesi	0	1	2	3	4

Ad Soyad:
Tarih:

ÇOCUKLAR İÇİN YAŞAM KALİTESİ ÖLÇEĞİ

Ergen Değerlendirme Formu (13-18 yaş)

Bir sonraki sayfada sizin için sorun olabilecek durumların listesi bulunmaktadır.
Lütfen son bir aylık süre içinde her birinin sizin için ne kadar sorun oluşturduğunu daire içine alarak belirtiniz.

Eğer sizin için **hiçbir zaman** sorun değilse	**0**
Eğer sizin için **nadiren** sorun oluyorsa	**1**
Eğer sizin için **bazen** sorun oluyorsa	**2**
Eğer sizin için **sıklıkla** sorun oluyorsa	**3**
Eğer sizin için **hemen her zaman** sorun oluyorsa	**4**

Burada yanlış ya da doğru cevaplar yoktur.
Eğer herhangi bir soruyu anlayamazsanız lütfen yardım isteyiniz.

Son bir ay içinde aşağıdakiler sizin için ne kadar sorun yarattı?

Sağlığım ve aktivitelerim ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Bir bloktan fazla yürümek bana zor gelir	0	1	2	3	4
2. Koşmak bana zor gelir	0	1	2	3	4
3. Spor ya da egzersiz yapmak bana zor gelir	0	1	2	3	4
4. Ağır bir şey kaldırmak bana zor gelir	0	1	2	3	4
5. Kendi başıma duş ya da banyo yapmak bana zor gelir	0	1	2	3	4
6. Evdeki günlük işleri yapmak bana zor gelir	0	1	2	3	4
7. Bir yerim acır ya da ağrır	0	1	2	3	4
8. Enerjim azdır	0	1	2	3	4

Duygularımla ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Korkmuş ya da ürkmüş hissederim	0	1	2	3	4
2. Hüzünlü ya da üzgün hissederim	0	1	2	3	4
3. Öfkeli hissederim	0	1	2	3	4
4. Uyumakta zorluk çekerim	0	1	2	3	4
5. Bana ne olacağı konusunda endişelenirim	0	1	2	3	4

Başkaları ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Yaşıtlarımla geçinmekte sorun yaşarım	0	1	2	3	4
2. Yaşıtlarım benimle arkadaş olmak istemezler	0	1	2	3	4
3. Yaşıtlarım benimle alay eder	0	1	2	3	4
4. Yaşıtlarımın yapabildikleri şeyleri yapamam	0	1	2	3	4
5. Yaşıtlarıma ayak uydurmakta zorluk çekerim	0	1	2	3	4

Okul ile ilgili sorunlar	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Hemen her zaman
1. Sınıfta dikkatimi toplamakta zorlanırım	0	1	2	3	4
2. Bazı şeyleri unuturum	0	1	2	3	4
3. Derslerimden geri kalmamak için zorluk çekerim	0	1	2	3	4
4. Kendimi iyi hissetmediğim için okula gidemediğim olur	0	1	2	3	4
5. Doktora ya da hastaneye gittiğim için okula gidemediğim olur	0	1	2	3	4

Çocuğunuzun adı Soyadı:
Tarih:

ÇOCUKLAR İÇİN YAŞAM KALİTESİ ÖLÇEĞİ

Ergen Değerlendirme Formu (Anne-Baba) (13-18 yaş)

Bir sonraki sayfada çocuğunuz için sorun olabilecek durumların listesi bulunmaktadır.
Lütfen son bir aylık süre içinde her birinin çocuğunuz için ne kadar sorun oluşturduğunu daire içine alarak belirtiniz.

Eğer çocuğunuz için **hiçbir zaman** sorun değilse	**0**
Eğer çocuğunuz için **nadiren** sorun oluyorsa	**1**
Eğer çocuğunuz için **bazen** sorun oluyorsa	**2**
Eğer çocuğunuz için **sıklıkla** sorun oluyorsa	**3**
Eğer çocuğunuz için **hemen her zaman** sorun oluyorsa	**4**

Burada yanlış ya da doğru cevaplar yoktur.
Eğer herhangi bir soruyu anlayamazsanız lütfen yardım isteyiniz.

Son bir ay içinde aşağıdakiler çocuğunuz için ne kadar sorun yarattı?

Fiziksel işlevsellik ile ilgili sorunlar	**Hiçbir zaman**	**Nadiren**	**Bazen**	**Sıklıkla**	**Hemen her zaman**
1. Bir bloktan fazla yürümek	0	1	2	3	4
2. Koşmak	0	1	2	3	4
3. Spor ya da egzersiz yapmak	0	1	2	3	4
4. Ağır bir şey kaldırmak	0	1	2	3	4
5. Kendi başına duş ya da banyo yapmak	0	1	2	3	4
6. Evdeki günlük işleri yapmak	0	1	2	3	4
7. Acısının ya da ağrısının olması	0	1	2	3	4
8. Düşük enerji düzeyi	0	1	2	3	4

Duygusal işlevsellik ile ilgili sorunlar	**Hiçbir zaman**	**Nadiren**	**Bazen**	**Sıklıkla**	**Hemen her zaman**
1. Korkmuş ya da ürkmüş hissetmek	0	1	2	3	4
2. Hüzünlü ya da üzgün hissetmek	0	1	2	3	4
3. Öfkeli hissetmek	0	1	2	3	4
4. Uyku ile ilgili zorluklar	0	1	2	3	4
5. Kendisine ne olacağı konusunda endişe duymak	0	1	2	3	4

Sosyal işlevsellik ile ilgili sorunlar	**Hiçbir zaman**	**Nadiren**	**Bazen**	**Sıklıkla**	**Hemen her zaman**
1. Yaşıtları ile geçimi	0	1	2	3	4
2. Yaşıtlarının onunla arkadaş olmak istememesi	0	1	2	3	4
3. Yaşıtları tarafından alay edilmesi	0	1	2	3	4
4. Yaşıtlarının yapabildiği şeyleri yapamaması	0	1	2	3	4
5. Yaşıtlarına ayak uyduramaması	0	1	2	3	4

Okul ile ilgili sorunlar	**Hiçbir zaman**	**Nadiren**	**Bazen**	**Sıklıkla**	**Hemen her zaman**
1. Sınıfta dikkatini toplayamaması	0	1	2	3	4
2. Bazı şeyleri unutması	0	1	2	3	4
3. Derslerinden geri kalması	0	1	2	3	4
4. Kendini iyi hissetmediği için okula gidememesi	0	1	2	3	4
5. Doktora ya da hastaneye gittiği için okula gidememesi	0	1	2	3	4

7.6. Curriculum Vitae

A. KİŞİSEL BİLGİLER

Adı Soyadı	Nur Ece Öztaş Şükür
Akademik unvan/pozisyon	Uzman Doktor
Görev yeri	Sakarya Serdivan Arabacıalanı Aile Sağlığı Merkezi

B. EĞİTİM BİLGİLERİ

Yıl	**Bölüm**	**Kurum**	**Derece**
2013	Tıp Fakültesi	Kocaeli Üniversitesi	Tıp doktoru
2018-2021	Aile Hekimliği Anabilim Dalı	Kocaeli Üniversitesi Tıp Fakültesi	Tıpta Uzmanlık
2019-Halen	Beslenme ve Diyetetik	Yeditepe Üniversitesi	Yüksek Lisans

C. İŞ TECRÜBESİNE AİT BİLGİLER

Tarih Aralığı	**Kurum**	**Görev**
2013-2014	Kocaeli Üniversitesi Tıp Fakültesi Çocuk Sağlığı ve Hastalıkları Anabilim Dalı	Araştırma Görevlisi
2014-2014	S. B. Akyazı Devlet Hastanesi	Pratisyen Hekim
2014-2015	S.B. Sakarya Eğitim ve Araştırma Hastanesi	Pratisyen Hekim
2015-2017	Sakarya Üniversitesi Tıp Fakültesi Patoloji Anabilim Dalı	Araştırma Görevlisi
2018-2021	Kocaeli Üniversitesi Tıp Fakültesi Aile Hekimliği Anabilim Dalı	Araştırma Görevlisi
2021- 2022	Sakarya Arifiye İlçe Sağlık Müdürlüğü	Uzman doktor
2022-Halen	Sakarya Serdivan Arabacıalanı Aile Sağlığı Merkezi	Uzman doktor

D. KLİNİK ARAŞTIRMALARLA İLGİLİ GENEL BİLGİLER

1. İyi Klinik Uygulamaları (İKU) ve klinik araştırma konularında alınan eğitim/sertifika bilgileri:

Aldığınız eğitime dair bir sertifika varsa lütfen bir kopyasını ekleyiniz.

Eğitim/sertifika adı ve eğitim yeri	**Tarih**

2. Görev alınan klinik araştırma bilgileri:

Görev olarak Sorumlu Araştırmacı, Yardımcı Araştırmacı, Koordinatör, Saha Görevlisi, İzleyici(Monitör), Eczacı vb. olarak belirtilmelidir.

Bu bölümdeki bilgileri tarih sırasına göre yazınız.

Klinik araştırma	**Tarih Aralığı**	**Görev**
The comparison of the effects of a novel hydrogel compound and traditional hyaluronate following micro-fracture procedure in a rat full-thickness chondral defect model. Akman YE, Sukur Erhan, Senel A, Oztas Sukur NE, Talu CK, Ozturkmen Y. Acta Orthop Traumatol Turc. 2017 Jul;51(4):331-336. doi: 10.1016/j.aott.2017.04.001. Epub 2017 Jun 13. PMID: 28622807.	2015-2017	Yardımcı Araştırmacı
Kocaeli Üniversitesi öğrencilerinin mediko-sosyal merkezi hakkındaki bilgi ve memnuniyet düzeyleri. EB Sarı, NEÖ Şükür, T Karaçoban, TM Alvur. Türkiye Aile Hekimliği Dergisi 2020;24(2):107-116 **Doi:** 10.15511/tahd.20.00207 TAHD-15-06-2020	2019-2020	Yardımcı Araştırmacı
Hypoalbuminemia leads to an increased risk of mortality and re-operation within 3-months in patients <75years of age after surgery for hip fractures. Kurtoğlu A, Oztas Sukur NE, Sukur E, Kochai A, Keskin D, Oz I, Sen Z. Progress in Nutrition. 23, 4 (Jan. 2022), e2021324. DOI:https://doi.org/10.23751/pn.v23i4.12175.	2020-2022	Yardımcı Araştırmacı
Mental health of Turkish medical students during the COVID-19 pandemic. Çimen İD, Alvur TM, Coşkun B, Şükür NEÖ. Int J Soc Psychiatry. 2021 Dec 28:207640211066734. doi: 10.1177/00207640211066734.	2020-2021	Yardımcı Araştırmacı

Epub ahead of print. PMID: 34961373.		

E. ÖZGEÇMİŞ SAHİBİNİN İMZASI

Yukarıda beyan ettiğim bilgilerin doğru ve güncel olduğunu ve klinik araştırmaların yürütülmesine ilişkin ilgili mevzuat hükümlerine ve iyi klinik uygulamalarına uyacağımı kabul ve beyan ederim.

Ad Soyad	Nur Ece Öztaş Şükür
Tarih (gün/ay/yıl olarak)	15.12.2020
İmza	..