



Peer-Interaction Group Support in Adolescents with Celiac Disease: A Randomized Controlled Study in Turkey

Melike Taşdelen Baş¹ · Hicran Çavuşoğlu² · Ayşegül Bükülmez³

Accepted: 16 November 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

Abstract

Background Celiac disease requires appropriate management and support, both medically and psychologically. This is especially important for adolescents, who may benefit from relevant peer interactions.

Objective This study evaluated the effects of interactive peer support on quality of life, friendship relations, and coping levels among adolescents with celiac disease.

Method This was a randomized controlled trial in which 36 adolescents (13–18 years of age) with celiac disease were equally divided into study and control groups. The study group was exposed to six interactive peer group sessions that were held every other week for 3 months under the supervision of nurses, while the control group was not exposed to any sessions, training, or consulting. All were assessed at baseline and post-intervention via the Pediatric Quality of Life Inventory, Friendship Qualities Scale, and KIDCOPE scale.

Results Several changes were detected upon final assessment. First, the mean scores for the PedsQL and FSS were significantly higher in the study group when compared to the control group. Second, the study group had higher mean scores for active coping and avoidance coping when compared to baseline. Third, the study group had significantly lower mean scores for negative coping when compared to the control group.

Conclusions Under the supervision of nurses, participants who were exposed to the peer support group showed improved quality of life, decreased social isolation, and enhanced positive coping strategies when dealing with celiac disease.

ClinicalTrials.gov Identifier NCT04533776.

Keywords Celiac disease · Adolescent · Quality of life · Friendship relations · Coping · Nursing care · Support group

✉ Melike Taşdelen Baş
meliket@gmail.com

Extended author information available on the last page of the article

Introduction

Celiac disease (CD) is an immune-mediated enteropathy that infects the small intestine due to gluten exposure. It is a chronic disease that is observed in approximately 1% of all people (Lebwohl et al., 2018; Lindfors et al., 2019). To date, the only known effective treatment for CD is a lifetime gluten-free diet (GFD) (Ciccocioppo et al., 2015; Lebwohl et al., 2018; Lindfors et al., 2019). In other words, patients with CD must consume gluten-free foods to stay healthy (Haines et al., 2008; Newton & Singer, 2012). However, GFD restrictions can be traumatic over the course of life (Skjerning et al., 2014). In fact, adherence to this diet is the main challenge for children with CD. Here, adolescents may find it particularly difficult to avoid foods that contain gluten, as dietary incompatibility is most common during this stage of development (Chauhan et al., 2010; Errichiello et al., 2010; Haines et al., 2008; Kautto et al., 2014; Newton & Singer, 2012; Sverker et al., 2005). Under these conditions, young adults and adolescents with CD may frequently experience dilemmas that catalyze intense emotional responses (Sverker et al., 2005). In turn, this can make it difficult to socialize, cope with GFD restrictions, manage daily life (Biagetti et al., 2013) issues, and participate in social activities (Chauhan et al., 2010).

Specifically, adolescents with CD may typically find that dilemmas arise when spending time with friends, dining out, and traveling (White et al., 2016). Due to the additional preparations needed for food-related events, these children may end up engaging in fewer activities overall, as such requirements may hinder their ability to experience full enjoyment in a variety of social contexts (Meyer & Rosenblum, 2017a). Adolescents with CD may also struggle with social problems, including issues pertaining to rules and desirability, as they must remain particularly careful when eating foods prepared outside the home (Skjerning et al., 2014). This may lead to feelings of isolation, fears about gluten contamination, and anxieties over potential bouts of sickness (Skjerning et al., 2014; Sverker et al., 2005).

Illness may simultaneously affect relationships and self-confidence. Children with chronic disease may have poor relationships and low self-esteem because they fear reactions and rejections from peers (Bower & Sharrett, 2014). In this regard, individuals with CD may find it difficult to maintain friendships, participate in leisure activities, follow dietary rules, and manage social life (de Lorenzo et al., 2012). Indeed, some adolescents with CD feel awkward, guilty, embarrassed, and misunderstood because they are afraid to explain their condition to friends (Wolf et al., 2018). Adolescents with CD may even feel ostracized by peers, thereby suffering from poor quality of life (Biagetti et al., 2013; Sevinç et al., 2017; White et al., 2016) and unfulfilling social relationships (Biagetti et al., 2013; Bower & Sharrett, 2014; Skjerning et al., 2014; Wolf et al., 2018).

There are three main reasons that adolescents with CD have difficulty adhering to their diets; namely, this includes peer pressure, difficulty accessing gluten-free foods (Errichiello et al., 2010), and the relatively high price of gluten-free food in general (Chauhan et al., 2010). In light of this, approximately 50% of all children and adolescents with CD do not appropriately follow their diets (Taghdir et al., 2016). Such a lack of compliance is associated with a low health-related quality of life, as optimal results require strict adherence to GFD rules (Barrio et al., 2018; Fidan et al., 2013). For adolescents with CD, this may entail a lower overall quality of life, greater number of physical problems, higher burden of disease, and family issues (Wagner et al., 2008). This highlights the need to secure access to gluten-free foods and find solutions to any challenges that arise during social situations (Meyer & Rosenblum, 2017a, b; Olsson et al., 2009; Wolf et al., 2018). For example, adolescents with CD may avoid eating at restaurants because they doubt the accuracy of listed

food contents. They may also avoid socializing with peers due to the difficulty of complying with social norms, as they may believe their dietary needs constitute a burden (Skjerning et al., 2014). Here, avoidance may become the preferred way of coping with stressors (Compas et al., 2012). In general, children and adolescents with chronic diseases such as CD must work to regulate their emotions, cognitive responses, behaviors, and interactions, defined as coping (Skjerning et al., 2014).

Active coping is a vital component of resilience for individuals who are faced with health problems and stress. It is an effective way of dealing with stressors. For children, active coping strategies are aimed at viewing problems from a more positive perspective while developing constructive coping skills. Individuals who are able to replace negative thoughts with positive thoughts during difficult events are more likely to experience positive changes and emotions (Mota & Matos, 2013). However, adolescents may use avoidance coping strategies to deal with negative situations and anxiety. More specifically, avoidance coping entails the use of cognitive strategies that are designed to change the way one thinks about a given problem; it can also be defined as a process in which one uses behavioral strategies to avoid problems or relieve tension by expressing emotions (Gerhart et al., 2014). A person is said to use negative coping strategies if they perceive a problem as a threat, then blame themselves and/or others if they believe that they cannot solve the problem (Bedel & Ulubey, 2015). According to Wagner et al. (2016), adolescents with CD should therefore receive coping training or psychological counseling aimed at the development of positive active coping strategies.

Current Study

This study focused on the effects of support groups aimed at helping children with CD. Support groups entail that all members address a single life issue, then support and educate one other through relevant discussions and activities. In other words, support groups are usually formed so that individuals with similar problems can deal with common situations and/or provide emotional support and relevant information. Importantly, these groups provide safe environments in which members can express and communicate their concerns and thoughts (Fjelnseth, 2016).

Some support groups are designed to help members manage chronic conditions, comply with treatments, and improve their quality of life. Members are therefore provided with opportunities to learn more about their condition, reinforce social commitments, reduce social isolation (Scheel et al., 2018), discuss shared problems, and exchange coping strategies (Camara et al., 2017).

Emotional and social support are critical for improving psychosocial well-being and emotional development among individuals with CD (Howard & Urquhart-Law, 2014). Meanwhile, educational and support-oriented interventions may encourage compliance with GFDs (Sainsbury et al., 2015). Typically, adolescents with CD find it beneficial to discuss their disease with peers who understand the condition (Rose & Howard, 2014). In turn, any friendships that develop can meet intimacy needs, thereby reducing feelings of isolation and improving the quality of social life (Bower & Sharrett, 2014).

With peer support groups, nurses can empower adolescents to manage their illness. In addition, the information shared within these support groups will also be useful in correcting the misinformation obtained from the internet and other media (Keil, 2019). Nurses can help adolescents cope with their daily and long-term problems by supervising support

groups to ensure that relevant feelings and thoughts are adequately expressed (Lawrence et al., 2010; Smeulders et al., 2010). As such, this study designed and tested a nurse-led interactive peer-support intervention for adolescents with CD. The main components included positive peer interactions, problem sharing, and the development of strategies and solutions aimed at dealing with CD. For participants, we hypothesized that the intervention would positively affect peer relationships and the overall quality of life while encouraging the use of active coping strategies.

Research Goals and Hypotheses

First, the effect of the intervention on participants' quality of life was explored. The first hypothesis was, "The intervention will have a positive effect on participants' quality of life" (H1). Second, the study focused on the effect of the intervention on participants' friendships. The second hypothesis was, "The intervention will have a positive effect on participants' friendships" (H2). Third, the study looked into the effect of the intervention on participants' coping strategies. The third hypothesis was, "The intervention will help participants use active coping strategies more often" (H3). Fourth, the study examined the effect of the intervention on participants' avoidance coping strategies. The hypothesis was, "the intervention will help participants use avoidance coping strategies less often" (H4). Fifth, the study investigated the effect of the intervention on participants' negative coping strategies. The hypothesis was, "The intervention will help participants use negative coping strategies less often" (H5). Evaluation of the hypotheses is discussed in the "23" section.

In this study, we explored how the intervention affected five main components for the participants, with each component represented by relevant scale scores (see "7" section below). Namely, this included their quality of life, friendships, general coping strategies, avoidance coping strategies, and negative coping strategies. Respective to each of these five goals, we developed the following hypotheses:

- H1: **Peer-interaction group support** improves the quality of life scores for adolescents with CD.
- H2: **Peer-interaction group support** improves friendship relations scores for adolescents with CD.
- H3: **Peer-interaction group support** improves active coping scores for adolescents with CD.
- H4: **Peer-interaction group support** reduces avoidance coping scores for adolescents with CD.
- H5: **Peer-interaction group support** reduces negative coping scores for adolescents with CD.

Method

Participants

The participants included a total of 36 adolescents with CD, each of whom were recruited by way of a pediatric outpatient clinic at a university hospital between June 22 and October

11, 2018. These participants were equally divided into study (intervention) and control (no intervention) groups. The inclusion criteria were as follows: CD diagnosis at least one year prior to recruitment, no other chronic diseases, no hospitalizations during the study period, and aged between 13 and 18 years. We determined the required sample size by conducting a power analysis using the G Power software. A previous study among children with CD in Turkey found a mean quality of life score of 69.1 ± 17.1 (Fidan et al., 2013). The aim was to increase the quality of life scores by an effect size of 0.8 following interactive peer support (an increase from 69.1 ± 17.1 – 82.8) by enrolling at least 15 individuals in the study group, for an error rate of 5% and power of 80% (G Power 3.1.9.2).

The adolescents who met the inclusion criteria were assigned numbers using a computer, with randomization then performed via the simple random sampling method. The groups were generated by assigning the first patient to the study group ($n=18$) and the second to the control group ($n=18$). Interactive peer support was provided to the study group, whereas the control group received no intervention.

Materials

Data Collection Tools

The researcher prepared a basic form that asked participants for information on seven sociodemographic items. They also completed three scales, including the Pediatric Quality of Life Inventory (PedsQL), Friendship Qualities Scale (FQS) and KIDCOPE coping scale, all of which are described in the following sections.

PedsQL

Varni et al. (1999) developed the PedsQL to measure quality of life in children and adolescents aged between 2 and 18 years. The scale was internally consistent based on a Cronbach's alpha value of 0.93. Çakin Memik et al. (2007) later used the scale among a sample of adolescents in Turkey aged between 13 and 18 years, with reliability and validity established based on a Cronbach's alpha value of 0.82. The scale consists of 23 items that are each rated on a 5-point Likert-type scale ranging from 0 to 4, with higher total scores indicating better health-related quality of life. There are two subscales, including physical and psychosocial health. Physical health pertains to whether respondents believe they are physically well, while psychosocial health is determined based on the sum of the emotional, social, and school functionality scores.

FQS

Bukowski et al. (1994) developed the FQS to evaluate prominent friend relationships (i.e., "best friends") held by children and adolescents aged between 10 and 18 years. The internal consistency coefficients of the scale components were 0.72 for companionship, 0.68 for conflict, 0.76 for closeness, 0.81 for help/aid, and 0.58 for security. Atik (2014a, 2014b) later established that the scale was valid and reliable for use in the Turkish context. In this study, the internal consistency coefficient of the entire scale was 0.85. The scale consists of 22 items across five subscales. Each item is rated on a 5-point Likert-type scale, with higher scores indicating more positive peer relationships.

KIDCOPE

Spirito et al. (1988) developed two forms of the KIDCOPE, including one for children (5–13 years of age) and one for adolescents (13–18 years of age). The scales were internally consistent based on a Cronbach's alpha value of 0.62. There are 11 items and 10 coping strategies, the latter of which are categorized across three subscales, including active, avoidance, and negative coping. Active coping includes cognitive restructuring, emotional regulation, social support, and problem-solving strategies, while avoidance coping includes self-distraction, social distancing, pent-up thinking, and withdrawal strategies, and negative coping includes self-criticism and blaming others. These scale components respectively measure how often respondents use specific coping strategies, with higher scores indicating greater usage for each. Bedel et al. (2014) later established that the scale was valid and reliable for use among adolescents in the Turkish context based on internal consistency coefficients of 0.66 for active coping, 0.61 for avoidance coping, and 0.76 for negative coping.

Procedure

All participants were informed of the study details. Further, all procedures complied with the provisions of the Declaration of Helsinki regarding research on human participants. We obtained written informed consent in all cases, with parental consent obtained for participants under 16 years of age. The study protocol was reviewed and approved by the Clinical Research Ethics Committee of Hacettepe University (meeting date: 05.24.2018, decision no: 2018/08-24 (KA- 180,047)).

Research Design

This was a randomized controlled experimental study.

Study Group

Prior to study engagement, we held a meeting with all participants in the study group ($n = 18$). At this time, we identified any needs and issues pertaining to CD. A meeting room in the outpatient clinic was used in all sessions. A total of six interactive peer group sessions were conducted:

- The first session addressed CD-associated diagnostic tests, clinical findings, and treatment methods.
- The second session addressed CD-associated thoughts/emotions and how the disease was perceived.
- The third session pointed out the importance of a GFD in the management of disease, how to prepare the diet at home, and diet compliance outside home.
- The fourth session addressed challenges experienced in social life due to CD.
- The fifth session focused on the effects of CD on academic success and peer relations.
- The sixth session addressed difficulties experienced when coping with CD in all areas.

Each session consisted of two 45-min components with a 20-min break in between. The participants were able to engage in conversations during these breaks. During the sessions, all participants were given opportunities to provide their opinions via the question-answer method. Here, they were asked to share their own coping methods and problems. Each discussion concluded with corrections to any false information presented, questions/answers, and a topical summary. The interactive peer-group support intervention lasted for a 3-month period, with sessions held every other week. The participants were contacted via telephone to receive information about the location and time of each meeting prior to commencement.

Each participant in the study group was also provided with a training booklet that included information about CD, including the symptoms, treatments, and dietary characteristics. This booklet was prepared based on expert advice from a pediatric gastroenterologist and three academicians in the field of pediatric nursing.

The first evaluation was conducted at the end of the first session, at which time participants completed the sociodemographic form, PedsQL, FQS, and KIDCOPE. At the end of the sixth session, each participant once again completed the PedsQL, FQS, and KIDCOPE. Figure 1 shows a CONSORT diagram of this study.

Control Group

The control group did not receive any interactive peer support. The first evaluation was conducted within the first week of the study period, at which time they completed the sociodemographic form, PedsQL, FQS, and KIDCOPE. The final evaluation was conducted at the same time the study group completed their intervention, at which time the control group once again completed the PedsQL, FQS, and KIDCOPE.

Analyses

We conducted all statistical analyses using the IBM SPSS version 24 package, with statistical significance established at $p < 0.05$. We used Levene's test to assess the homogeneity of variance, and used the Shapiro–Wilk test to evaluate the suitability of the study data to the normal distribution. Accordingly, we used frequency distributions (numbers and percentages) for the independent variables.

We used the independent samples t-test (t-table value) to compare two independent groups with normally distributed data, and used the paired samples t-test (t-table value) to compare two dependent groups. Finally, we used the Mann–Whitney U test (Z-table value) to compare two independent groups that did not show normally distributed data, and used the Wilcoxon test (Z-table value) to compare two dependent groups. Cohen's d was used as an effect size measure for pairwise comparisons. Since both parametric and non-parametric methods were included in this study, all effect sizes were calculated as Cohen d for comparison. Calculated effect sizes can be interpreted using thresholds of $> 0.2 - 0.5$, $> 0.5 - 0.8$, and > 0.8 for small, moderate, and large effects, respectively (Cohen, 1988). Also, effect sizes are interpreted as $d > 1.2 =$ very large effect and $d > 2.0 =$ huge effect. The effect sizes for the interventions are shown in subsequent sections (Sawilowsky, 2009).

Similar to our study, in a study evaluating group effectiveness for adolescents with Type 1 Diabetes Mellitus, quality of life was improved (effect size Cohen's $d = 0.43$) (Kichler et al., 2013). In this study, the effect size was calculated between 1.030 and 2.581 values for the quality of life scores after the intervention.

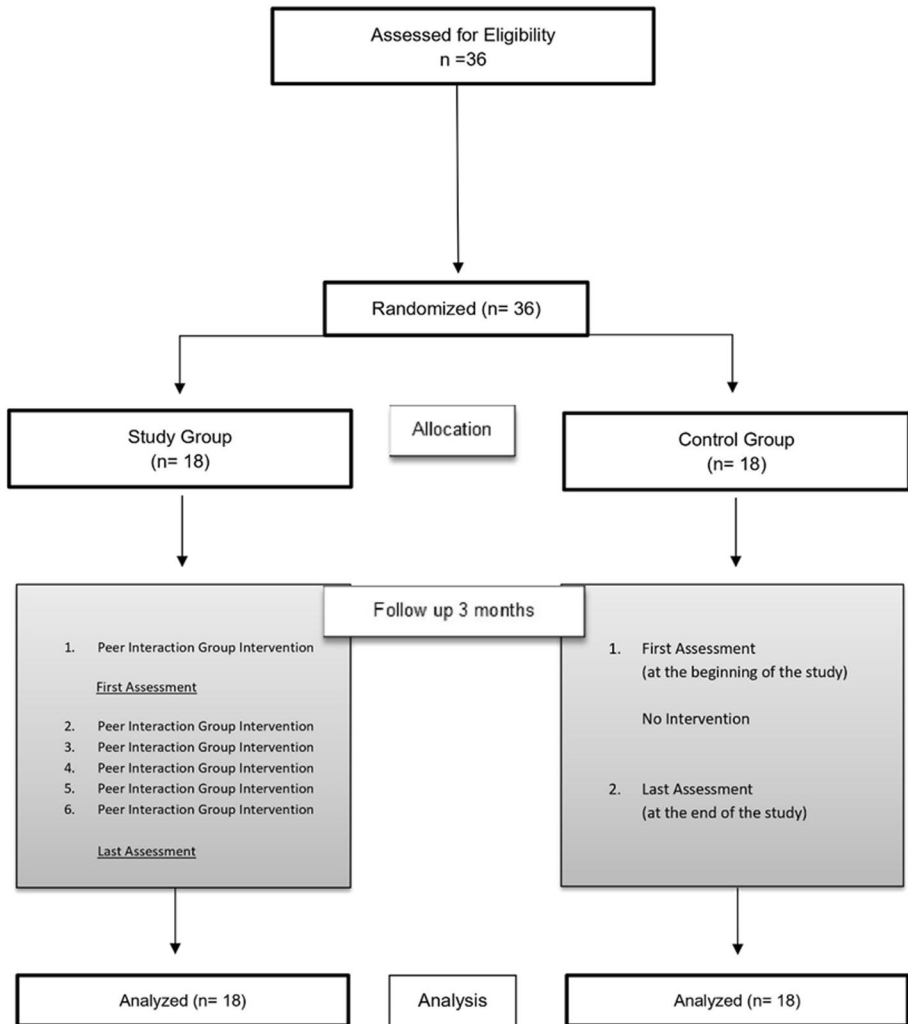


Fig. 1 Consort diagram

Results

Participant Characteristics

The descriptive characteristics of the adolescents in the study and control groups are presented in Table 1. As shown, there were no statistically significant intergroup differences ($p > 0.05$).

Table 1 Descriptive characteristics of the study and control groups

Characteristics (<i>N</i> = 36)	Study group (<i>n</i> = 18)		Control group (<i>n</i> = 18)		<i>p</i> *
	<i>n</i>	(%)	<i>n</i>	(%)	
<i>Gender</i>					
Female	13	72.2	11	61.1	0.494
Male	5	27.8	7	38.9	
<i>Age</i>					
13–14	11	61.1	11	61.1	0.922
15–16	4	22.2	4	22.2	
17–18	3	16.7	3	16.7	
<i>Residential area</i>					
City center	8	44.4	9	50.0	0.337
County center	3	16.7	6	33.3	
Village	7	38.9	3	16.7	
<i>Education level of the patient</i>					
Attending secondary school	7	38.9	10	55.6	0.331
Attending high school	11	61.1	8	44.4	
<i>Family income level</i>					
Quite enough	1	5.6	1	5.6	0.403
Enough	3	16.6	4	22.2	
Middle	9	50.0	11	61.1	
Insufficient	5	27.8	2	11.1	
<i>Time elapsed after diagnosis</i>					
1 year	5	27.8	5	27.8	0.138
2–4 years	5	27.8	9	50.0	
5 years and over	8	44.4	4	22.2	

**p* > 0.05

The Effects of the Peer Group Intervention on Quality of Life

Upon final assessment, the mean PedsQL score for the study group was significantly higher than for the control group ($Z = -4.734$; $p < 0.001$, Cohen's $d = 2.581$). The study group also returned a significantly higher mean PedsQL score upon final assessment when compared to the first assessment ($Z = -3.681$; $p < 0.001$, Cohen's $d = 1.128$). In addition, the study group showed higher mean scores on both the physical health subscale ($t = 6.614$; $p < 0.001$, Cohen's $d = 2.204$) and psychosocial health subscale ($t = 6.451$; $p < 0.001$, Cohen's $d = 2.150$) when compared to the control group. For the control group, there were no statistically significant differences between the first and last assessments in terms of the physical health sub-dimension score ($p > 0.05$); however, the final assessment scores were significantly lower on the psychosocial health subscale ($t = 2.715$; $p = 0.015$, Cohen's $d = 0.125$). See Table 2 for a detailed list of results.

Table 2 Mean scores of the pediatric quality of life inventory (PedsQL) in the study and control groups according to the first and last assessment

		Study group <i>M (SD)</i>	Control group <i>M (SD)</i>	Test value	<i>p</i> value	Cohen's <i>d</i>
PedQL	First assessment	77.54 ± 11.56	68.90 ± 10.39	<i>t</i> = 2.357	0.024 ^{*a}	0.786
	Last assessment	88.89 ± 6.75	67.45 ± 9.61	<i>Z</i> = -4.734	< 0.001 ^{***c}	2.581
	Test value	<i>Z</i> = -3.681	<i>t</i> = 2.871			
	<i>p</i> value	< 0.001 ^{***d}	0.011 ^{*b}			
Physical health	First assessment	75.00 ± 14.85	62.85 ± 16.32	<i>t</i> = 2.336	0.026 ^{*a}	0.778
	Last assessment	87.67 ± 9.06	61.11 ± 14.43	<i>t</i> = 6.614	< 0.001 ^{***a}	2.204
	Test value	<i>t</i> = -6.925	<i>t</i> = 1.966			
	<i>p</i> value	< 0.001 ^{***b}	0.066 ^b			
Psychosocial health	First assessment	78.89 ± 11.99	72.13 ± 10.33	<i>t</i> = 1.812	0.079 ^a	0.604
	Last assessment	89.54 ± 6.51	70.83 ± 10.44	<i>t</i> = 6.451	< 0.001 ^{***a}	2.150
	Test value	<i>t</i> = -5.209	<i>t</i> = 2.715			
	<i>p</i> value	< 0.001 ^{***b}	0.015 ^{*b}			
	Cohen's <i>d</i>	1.103	0.125			

The effect size value corresponding to each is shown as Cohen's *d*. Effect size Cohen's *d* (0.2–0.5 small effect, 0.5–0.8 moderate effect, > 0.8 large effect, > 1.2 very large effect and > 2.0 huge effect)

SD standard deviation, *M* mean

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^a*T* test (*t*-table value), ^bPaired sample (*t*-table value), ^cMann–Whitney *U* (*Z*-table value), ^dWilcoxon" test (*Z*-table value)

The Effects of the Peer Group Intervention on Friendship Quality

Upon final assessment, the study group returned a significantly higher total mean score on the FQS when compared to the control group ($t = 2.593$, $p = 0.014$, Cohen's $d = 0.865$; $t = 6.837$, $p < 0.001$, Cohen's $d = 2.279$). Further, the study group showed a significantly higher total mean score on the FQS upon final assessment when compared to the first assessment ($t = -5.781$; $p < 0.001$, Cohen's $d = 0.946$). For the control group, there were no statistically significant differences between the first and last total mean scores on the FQS ($p > 0.05$).

Looking at the FQS subscales, the study group had significantly higher scores for companionship ($t = 4.631$; $p < 0.001$, Cohen's $d = 3.585$), conflict ($Z = -3.490$; $p < 0.001$, Cohen's $d = 1.329$), help/aid ($Z = -4.200$; $p < 0.001$, Cohen's $d = 1.762$), security ($Z = -4.110$; $p < 0.001$, Cohen's $d = 1.938$), and closeness ($Z = -2.881$; $p = 0.004$, Cohen's $d = 1.140$) when compared to the control group. See Table 3 for detailed results.

The Effects of the Peer Group Intervention on Coping Behaviors

Upon final assessment, there were no statistically significant differences between the study and control groups in terms of their active coping subscale scores on the

Table 3 Mean scores of the friendship qualities scale in the study and control groups according to the first and last assessment

		Study group <i>M (SD)</i>	Control group <i>M (SD)</i>	Test value	<i>p</i> value	Cohen's <i>d</i>
Friendship Qualities Scale	First assessment	87.06 ± 13.26	75.22 ± 14.11	<i>t</i> = 2.593	0.014 ^{*a}	0.865
	Last assessment	97.94 ± 7.15	74.33 ± 12.79	<i>t</i> = 6.837	0.000 ^{***a}	2.279
	Test value	<i>t</i> = - 5.781	<i>t</i> = 1.315			
	<i>p</i> value	< 0.001 ^{***b}	0.206 ^b			
	Cohen's <i>d</i>	0.946	0.065			
Companionship	First assessment	12.56 ± 3.94	11.39 ± 3.82	<i>t</i> = 0.901	0.374 ^a	0.301
	Last assessment	16.22 ± 2.29	11.39 ± 3.79	<i>t</i> = 4.631	< 0.001 ^{***a}	3.585
	Test value	<i>t</i> = - 6.061	<i>t</i> = 0.000			
	<i>p</i> value	< 0.001 ^{***b}	1.000 ^b			
	Cohen's <i>d</i>	1.135	0			
Conflict	First assessment	16.11 ± 3.68	14.61 ± 2.66	<i>Z</i> = - 1.831	0.067 ^c	0.473
	Last assessment	17.61 ± 2.40	14.22 ± 2.71	<i>Z</i> = - 3.490	< 0.001 ^{***c}	1.329
	Test value	<i>Z</i> = - 2.601	<i>t</i> = 1.511			
	<i>p</i> value	0.009 ^{**d}	0.149 ^b			
	Cohen's <i>d</i>	0.493	0.145			
Helping	First assessment	21.78 ± 3.03	17.11 ± 5.20	<i>Z</i> = - 2.704	0.007 ^{**c}	1.106
	Last assessment	23.17 ± 1.79	16.44 ± 5.10	<i>Z</i> = - 4.200	< 0.001 ^{***c}	1.762
	Test value	<i>Z</i> = - 2.361	<i>t</i> = 2.287			
	<i>p</i> value	0.018 ^{*d}	0.035 ^{*b}			
	Cohen's <i>d</i>	0.576	0.130			
Security	First assessment	14.89 ± 4.11	12.44 ± 3.17	<i>Z</i> = - 1.954	0.051 ^c	0.673
	Last assessment	17.56 ± 2.31	12.83 ± 2.57	<i>Z</i> = - 4.110	< 0.001 ^{***c}	1.938
	Test value	<i>Z</i> = - 3.217	<i>Z</i> = - 1.645			
	<i>p</i> value	0.001 ^{***d}	0.100 ^d			
	Cohen's <i>d</i>	0.831	0.135			
Closeness	First assessment	21.77 ± 3.59	19.67 ± 4.96	<i>Z</i> = - 1.195	0.232 ^c	0.491
	Last assessment	23.39 ± 1.58	19.44 ± 4.62	<i>Z</i> = - 2.881	0.004 ^{**c}	1.140
	Test value	<i>Z</i> = - 2.373	<i>Z</i> = - 0.239			
	<i>p</i> value	0.018 ^{*d}	0.811 ^d			
	Cohen's <i>d</i>	0.580	0.061			

The effect size value corresponding to each is shown as Cohen's *d*. Effect size Cohen's *d* (0.2–0.5 small effect, 0.5–0.8 moderate effect, > 0.8 large effect, > 1.2 very large effect and > 2.0 huge effect)

SD standard deviation, *M* mean

p* < 0.05; *p* < 0.01; ****p* < 0.001

^a*T*-test (*t*-table value), ^bPaired sample (*t*-table value), ^cMann–Whitney *U* (*Z*-table value), ^dWilcoxon" test (*Z*-table value)

KIDCOPE (*p* > 0.05). However, the study group returned a significantly higher mean active coping score upon final assessment when compared to the first assessment (*t* = - 2.712; *p* = 0.015, Cohen's *d* = 0.585); surprisingly, this was also the result for the control group (*Z* = - 2.041; *p* = 0.041, Cohen's *d* = 0.274).

The final assessment also showed no statistically significant differences between the study and control groups in terms of their avoidance coping subscale scores ($p > 0.05$). However, the study group showed a significantly higher avoidance coping score upon final assessment when compared to the first assessment ($t = -2.486$; $p = 0.024$, Cohen's $d = 0.750$); again, this was also the case for the control group ($Z = -2.428$; $p = 0.015$, Cohen's $d = 0.381$).

Finally, the study group returned a significantly higher score for negative coping post-intervention when compared to the control group ($Z = -2.660$; $p = 0.008$, Cohen's $d = 0.700$). The study group also had a higher mean score for negative coping upon final assessment when compared to the first assessment ($Z = -2.156$; $p = 0.031$, Cohen's $d = 0.505$). For the control group, there were no statistically significant differences in mean negative coping scores between the first and final assessments ($p > 0.05$). See Table 4 for detailed results.

Discussion

This study examined how six sessions of a peer-interactive group intervention affected quality of life, friendships, and coping levels for adolescents with CD. Each of these elements are discussed in detail in the subsections below.

Table 4 Mean scores of the KIDCOPE in the study and control groups according to the first and last assessment

		Study group <i>M (SD)</i>	Control group <i>M (SD)</i>	Test value	<i>p</i> value	Cohen's <i>d</i>
Active coping	First assessment	7.00 ± 2.57	5.78 ± 2.71	$Z = -1.324$	0.185 ^c	0.462
	Last assessment	8.39 ± 2.12	6.56 ± 2.97	$Z = -1.709$	0.087 ^c	0.709
	Test value	$t = -2.712$	$Z = -2.041$			
	<i>p</i> value	0.015 ^{*b}	0.041 ^{*d}			
	Cohen's <i>d</i>	0.585	0.274			
Avoidance coping	First assessment	4.72 ± 1.93	5.17 ± 1.54	$t = -0.762$	0.451 ^a	0.258
	Last assessment	6.06 ± 1.59	5.72 ± 1.32	$t = -0.679$	0.497 ^a	0.233
	Test value	$t = -2.486$	$Z = -2.428$			
	<i>p</i> value	0.024 ^{*b}	0.015 ^{*d}			
	Cohen's <i>d</i>	0.750	0.381			
Negative coping	First assessment	2.11 ± 1.53	2.50 ± 1.92	$t = -0.673$	0.506 ^a	0.246
	Last assessment	1.28 ± 1.74	2.39 ± 1.41	$Z = -2.660$	0.008 ^{***c}	0.700
	Test value	$Z = -2.156$	$t = 0.325$			
	<i>p</i> value	0.031 ^{*d}	0.749 ^b			
	Cohen's <i>d</i>	0.505	0.063			

The effect size value corresponding to each is shown as Cohen's *d*. Effect size Cohen's *d* (0.2–0.5 small effect, 0.5–0.8 moderate effect, > 0.8 large effect, > 1.2 very large effect and > 2.0 huge effect)

SD standard deviation, *M* mean

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^a*T*-test (*t*-table value), ^bPaired sample (*t*-table value), ^cMann–Whitney *U* (*Z*-table value), ^dWilcoxon" test (*Z*-table value)

Quality of Life

As mentioned, this element was assessed using the PedsQL. Here, the interactive peer support intervention led to an increase in the mean quality of life score for the study group. Moreover, the final evaluation revealed that both the mean physical and psychosocial health scores were significantly higher in the study group when compared to the control group ($p < 0.001$), thus confirming H1 (Table 2).

Participants in the study group were asked to share their problems during the peer support sessions. This was aimed at reducing feelings of isolation and facilitating a mutual understanding of the various strategies used to deal with CD. Importantly, supervisors also corrected false information during these sessions, with health education and consultancy services offered to all participants. At the end of the 3-month study period, the study group showed increased scores on physical and psychosocial health, both of which are sub-dimensions of the quality of life scale. By contrast, the control group actually showed a decrease in the mean quality of life score.

Previous studies have examined the effects of similar peer support groups for children and adolescents with different chronic diseases (Al-sheyab et al., 2012; Cai et al., 2017; Scheel et al., 2018). For example, Scheel et al. (2018) implemented such an intervention for children with rheumatic heart disease, thus finding higher scores for physical health, social functionality, and academic functionality. Kohut et al. (2020) investigated the effects of a mindfulness-based group intervention for adolescents with inflammatory bowel disease, thus finding improved physical health.

Research has also shown that peer relationship can positively affect emotional well-being and psychological functionality for adolescents (Last et al., 2007; Snead et al., 2004; Floyd et al., 2017) investigated the effects of group meetings for adolescents diagnosed with type 1 diabetes mellitus, thus finding significant improvements in quality of life, school functioning, and psychosocial functioning. Further, a systematic review showed overall improvements in quality of life based on the results of peer group support interventions aimed at helping adolescents with various chronic illnesses (Ahola Kohut et al., 2014). Meanwhile, the current study produced similarly positive results for issues pertaining to quality of life.

Friendship Quality

Upon final assessment, the study group showed a significantly higher mean friendship quality score when compared to the control group, thus confirming H2 ($p < 0.001$); in fact, the study group showed significantly higher mean scores for each of the FQS subscales, including companionship, conflict, help/aid, security, and closeness. In general, we observed improvements in friendships across the study group (Table 3).

Previous studies have also shown that peer-support group interventions can improve friendship relations for children with various chronic diseases. In turn, this reduces feelings of social isolation (Lewis et al., 2016; Scheel et al., 2018; Stewart et al., 2013). For example, Melita et al. (2019) found positive effects for adolescents with sickle cell anemia who shared their experiences with others during self-management and problem-solving interventions. A study in Africa showed increased peer interactions following a peer-support group intervention among adolescents aged 12–18 years who were diagnosed with AIDS (Barker et al., 2019). The current study provides additional evidence supporting these claims.

Rabaglietti and Ciairano (2008) found that conflicts between peers could ultimately result in positive relationships among youths. In the same study, male participants who entered such conflicts eventually showed that both sides were willing to forego personal interests in order to maintain the friendship. In turn, this resulted in deeper relationships. In the current study, increased scores on the conflict subdimension of the peer relations scale among participants in the study group indicates an increased rate of disagreement between peers; that is, an increase in peer relations.

The higher scores on the help/aid subscale of the FQS reflect an increase in solidarity between peers. In this regard, participants in the study group helped their peers more often than those in the control group. It is important for peers with similar diseases to share their problems and help one another (Camara et al., 2017). For the study group, increased scores on the security subscale indicate improved confidence in the idea that problems related to CD can be solved through group support. This further shows that peer support groups are important sources of aid for adolescents with chronic disease, as they are given opportunities to share information about similar experiences and problems, thus providing an avenue for mutual help. Importantly, these groups also create safe environments in which to express concerns that may otherwise result in stigmatization.

During adolescence, intimacy and attachment behaviors emerge through the act of sharing feelings, anxieties, and fears with connected person when needed, not through physical intimacy (Bauminger et al., 2008). In this investigation, participants in the study group showed higher scores for closeness than the control group upon final assessment, thus indicating the establishment of a close and safe environment via the peer support intervention.

Adolescents are frequently able to address their problems by meeting with peers in order to share common experiences as a group. In this context, individuals with similar conditions may discover alternative solutions to problems. The common bonds established between group members ensure continued opportunities to share experiences, thereby reducing feelings of isolation and despair. Finally, peer groups establish a sense of belonging, which is crucial for the development of personal identity while decreasing feelings of being different. Honesty, understanding, and support are key factors in these environments.

Coping

Active Coping

The active coping strategy consists of active cognitive restructuring, problem solving, emotion regulation, and social support (Spirito et al., 1994). Here, coping behavior is considered a significant component in the development of life and psychosocial skills among adolescents (Zimmer-Gembeck & Skinner, 2016). While the study group had higher active coping scores than the control group upon final assessment, this difference was not statistically significant, thus rejecting H3 (Table 4). Following the intervention, the study group exhibited more active coping strategies, including cognitive restructuring, problem solving, emotion regulation, and social support. Meanwhile, the control group also returned an increased score for active coping. This shows that individuals may gradually improve their psychosocial skills without direct interventions.

Wagner et al. (2016) found that adolescents with CD used active coping strategies regardless of whether they adhered to GFD restrictions. Following peer-interactive group interventions, previous studies have also found positive results in the development of coping skills, symptom reduction, and understanding how to solve disease-related problems

(Creedy et al., 2005; Plante et al., 2001). For example, participants with inflammatory bowel disease were thus able to improve their physical well-being and showed improved stress management skills. In this regard, adolescents may feel less alone and more able to cope with their disease (Kohut et al., 2020). Another study conducted interviews with adolescents who were diagnosed with epilepsy, thus finding that participants were able to develop better relationships with peers, gave positive evaluations about themselves, and reported improved self-esteem (Chew et al., 2019). The current study produced very similar findings.

Avoidance Coping

Upon final assessment, we found no statistically significant intergroup differences in terms of avoidance coping scores ($p > 0.05$). However, we did find that avoidance coping behaviors increased in both groups, thus rejecting H4 (Table 4). The avoidance coping strategy is applied in various ways, such as focusing on different aspects, anxiety, low self-esteem, depressive symptoms, and avoiding current situations (Gerhart et al., 2014; Eisenberg et al., 2012) found that individuals who adopted avoidance coping had decreased psychological functionality, more anxiety, and greater susceptibility to depression. Other reports have also shown that individuals who perceive their illness as more serious tend to adopt avoidance coping strategies, such as denial and withdrawal (Kaptein et al., 2006; Torres-Ortuño et al., 2019).

In studies conducted with children and adolescents with type 1 diabetes and inflammatory bowel disease, results showed that participants mainly used the avoidance coping strategy (Jaser & White, 2011; Mackner et al., 2014). While there have been no intervention studies focusing on this specific strategy to date, an individual's perception of their own disease plays an important role in determining which strategy is applied (Gray & Rutter, 2007; Kaptein et al., 2006). In studies showed that psychological stress and anxiety increase the use of avoidant coping strategies (Clavé et al., 2019; Luyckx et al., 2010). In this study, the increased rate of avoidance coping following the intervention may be associated with decreased psychological functionality, anxiety, and depression. In sum, we believe that six sessions may not be sufficient for reducing negative behaviors such as distraction, withdrawal, social distancing, and desiring thinking within the avoidance coping strategy. Future studies should therefore implement a greater number of sessions.

Negative Coping

The study group showed a significantly lower mean score for negative coping when compared to the control group ($p = 0.031$), thus supporting H5 (Table 4). Following the intervention, participants in the study group were less apt to engage in self-criticism and blame others, both of which are negative coping strategies. A negative coping strategy is generally defined as one that arises due to stress. In turn, they blame themselves and others, and may even show harmful behaviors.

In this regard, Wagner et al. (2016) recommended educational and behavioral interventions aimed at reducing the application of negative coping strategies. For adolescents with similar health problems and/or chronic diseases, this includes sharing information on management practices and treatment effects (Camara et al., 2017). There is no other study in the literature evaluating negative coping strategies.

In this investigation, participants in the study group shared information about the specific coping methods they used to deal with CD. Here, the peer support intervention provided critical learning opportunities while reducing the application of negative coping. In fact, the participants directly reported that the intervention was an important source of support, especially because it helped alleviate their problems while providing an avenue for obtaining more accurate information about disease management.

This study also had some limitations. First, the intervention was only conducted for 3 months, which may not have sufficiently targeted all relevant behaviors. Second, the relatively small sample size limits the generalizability of the findings. As such, future studies should conduct the intervention in a clinical setting among a larger research sample, thus improving the strength of the results.

Conclusions

This study implemented a peer-interactive group support intervention among adolescents with CD, with all sessions supervised by nurses. We thus found increased quality of life, positive developments in peer relationships, the increased usage of both active and avoidance coping strategies, and the decreased application of negative coping strategies. In sum, the intervention contributed to better overall quality of life while decreasing feelings of social isolation through positive coping methods and mutual aid. This shows the importance of provisions in which nurses work with adolescents suffering from chronic diseases in pediatric clinics and outpatient settings. For those with CD, such interventions should help identify specific needs and problems related to disease management. Importantly, we recommend intervention periods longer than three month in addition to follow-up assessments. Finally, qualitative research is needed to more comprehensively analyze the specific problems experienced by adolescents with CD.

Author Contributions Dr. MTB, Dr. HÇ, Dr. AB, had primary responsibility for protocol development, patient screening, enrollment, outcome assessment, preliminary data analysis and writing the manuscript. Dr. MTB, Dr. AB, participated in the development of the protocol and analytical framework for the study and contributed to the writing of the manuscript. Dr. MTB and Dr. HÇ, contributed in the same ways as Dr. MTB and Dr. AB, and was responsible for patient screening. Dr. MTB, Dr. HÇ, Dr. AB, supervised the design and execution of the study, performed the final data analyses and contributed to the writing of the manuscript.

Funding No funding was received for this study.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval An ethics approval was taken from the Clinical Research Ethics Committee of Hacettepe University (meeting date: 05.24.2018, decision no: 2018/08-24 (KA-180047)).

References

- Ahola Kohut, S., Stinson, J., Giosa, L., Luca, S., & van Wyk, M. (2014). Systematic review of peer support interventions for adolescents with chronic illness: A narrative analysis. *International Journal of Child and Adolescent Health*, 7(3), 183–197.
- Al-sheyab, N., Gallagher, R., Crisp, J., & Shah, S. (2012). Peer-led education for adolescents with asthma in Jordan: A cluster-randomized controlled trial. *Pediatrics*, 129(1), e106–e112.
- Atik, Z. E., Çoban, A. E., Çok, F., Doğan, T., & Karaman, N. G. (2014). The Turkish adaptation of the Friendship Qualities Scale: A validity and reliability study. *Educational Sciences: Theory and Practice*, 14(2), 440–446.
- Barker, D., Enimil, A., Galárraga, O., Bosomtwe, D., Mensah, N., Thamocharan, S., & Kwara, A. (2019). In-clinic adolescent peer group support for engagement in sub-Saharan Africa: A feasibility and acceptability trial. *Journal of the International Association of Providers of AIDS Care (JIAPAC)*, 18, 2325958219835786.
- Barrio, J., Cilleruelo, M. L., Román, E., & Fernández, C. (2018). Health-related quality of life in Spanish coeliac children using the generic KIDSCREEN-52 questionnaire. *European Journal of Pediatrics*, 177(10), 1515–1522.
- Bauminger, N., Finzi-Dottan, R., Chason, S., & Har-Even, D. (2008). Intimacy in adolescent friendship: The roles of attachment, coherence, and self-disclosure. *Journal of Social and Personal Relationships*, 25(3), 409–428.
- Bedel, A., Işık, E., & Hamarta, E. (2014). Psychometric properties of the KIDCOPE in Turkish adolescents. *Education and Science*. <https://doi.org/10.15390/EB.2014.3501>
- Bedel, A., & Ulubey, E. (2015). The role of cognitive flexibility on explanation adolescent's coping strategies. *Electronic Journal of Social Sciences*, 14(55), 291–300.
- Biagetti, C., Naspi, G., & Catassi, C. (2013). Health-related quality of life in children with celiac disease: A study based on the critical incident technique. *Nutrients*, 5(11), 4476–4485.
- Bower, S. L., & Sharrett, M. K. (2014). *Celiac disease: A guide to living with gluten intolerance*. Demos Medical Publishing
- Bukowski, W. M., Hoza, B., & Boivin, M. (1994). Measuring friendship quality during pre-and early adolescence: The development and psychometric properties of the Friendship Qualities Scale. *Journal of Social and Personal Relationships*, 11(3), 471–484.
- Cai, R. A., Holt, R. I., Casdagli, L., Viner, R. M., Thompson, R., Barnard, K., & Christie, D. (2017). Development of an acceptable and feasible self-management group for children, young people and families living with Type 1 diabetes. *Diabetic Medicine*, 34(6), 813–820.
- Camara, M., Bacigalupe, G., & Padilla, P. (2017). The role of social support in adolescents: Are you helping me or stressing me out? *International Journal of Adolescence and Youth*, 22(2), 123–136.
- Chauhan, J., Kumar, P., Dutta, A., Basu, S., & Kumar, A. (2010). Assessment of dietary compliance to gluten free diet and psychosocial problems in Indian children with celiac disease. *The Indian Journal of Pediatrics*, 77(6), 649–654.
- Chew, J., Carpenter, J., & Haase, A. M. (2019). Living with epilepsy in adolescence—A qualitative study of young people's experiences in Singapore: Peer socialization, autonomy, and self-esteem. *Child: Care, Health and Development*, 45(2), 241–250.
- Ciccocioppo, R., Kruzliak, P., Cangemi, G. C., Pohanka, M., Betti, E., Lauret, E., & Rodrigo, L. (2015). The spectrum of differences between childhood and adulthood celiac disease. *Nutrients*, 7(10), 8733–8751.
- Clavé, S., Tsimaratos, M., Boucekine, M., Ranchin, B., Salomon, R., Dunand, O., & Roussey, G. (2019). Quality of life in adolescents with chronic kidney disease who initiate haemodialysis treatment. *BMC Nephrology*, 20(1), 1–10.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates, Publishers.
- Compas, B. E., Jaser, S. S., Dunn, M. J., & Rodriguez, E. M. (2012). Coping with chronic illness in childhood and adolescence. *Annual Review of Clinical Psychology*, 8, 455–480.
- Creedy, D., Collis, D., Ludlow, T., Cosgrove, S., Houston, K., Irvine, D., & Moloney, S. (2005). Development and evaluation of an intensive intervention program for children with a chronic health condition: A pilot study. *Contemporary Nurse*, 18(1–2), 46–56.
- Cakin Memik, N., Ağaoğlu, B., Coşkun, A., Uneri, O. S., & Karakaya, I. (2007). The validity and reliability of the Turkish Pediatric Quality of Life Inventory for children 13–18 years old. *Turkish Journal of Psychiatry*, 18(4), 353–363.
- de Lorenzo, C. M., Xikota, J. C., Wayhs, M. C., Nassar, S. M., & de Souza Pires, M. M. (2012). Evaluation of the quality of life of children with celiac disease and their parents: A case–control study. *Quality of Life Research*, 21(1), 77–85.

- Eisenberg, S. A., Shen, B. J., Schwarz, E. R., & Mallon, S. (2012). Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *Journal of Behavioral Medicine, 35*(3), 253–261.
- Errichiello, S., Esposito, O., Di Mase, R., Camarca, M. E., Natale, C., Limongelli, M. G., & Strisciuglio, P. (2010). Celiac disease: Predictors of compliance with a gluten-free diet in adolescents and young adults. *Journal of Pediatric Gastroenterology and Nutrition, 50*(1), 54–60.
- Fidan, T., Ertekin, V., & Karabag, K. (2013). Depression-anxiety levels and the quality of life among children and adolescents with coeliac disease. *Dusunen Adam The Journal of Psychiatry and Neurological Sciences, 26*(3), 232.
- Fjelnseth, K. P. (2016). *Emotional communication in support groups: An explorative study of youth and therapist assessments of communication in support groups for siblings of children with chronic illness or disability* (Master's thesis).
- Floyd, B. D., Block, J. M., Buckingham, B. B., Ly, T., Foster, N., Wright, R., & Shah, A. C. (2017). Stabilization of glycemic control and improved quality of life using a shared medical appointment model in adolescents with type 1 diabetes in suboptimal control. *Pediatric Diabetes, 18*(3), 204–212.
- Gerhart, J. I., Baker, C. N., Hoerger, M., & Ronan, G. F. (2014). Experiential avoidance and interpersonal problems: A moderated mediation model. *Journal of Contextual Behavioral Science, 3*(4), 291–298.
- Gray, S. E., & Rutter, D. R. (2007). Illness representations in young people with Chronic Fatigue Syndrome. *Psychology & Health, 22*(2), 159–174.
- Haines, M., Anderson, R. P., & Gibson, P. R. (2008). Systematic review: The evidence base for long-term management of coeliac disease. *Alimentary Pharmacology & Therapeutics, 28*(9), 1042–1066.
- Howard, R. A., & Urquhart-Law, G. (2014). Psychological well-being of children and young people with coeliac disease. In *Paediatric Gastrointestinal Disorders* (pp. 186–207). CRC Press.
- Jaser, S., & White, L. (2011). Coping and resilience in adolescents with type 1 diabetes. *Child: Care, Health and Development, 37*(3), 335–342.
- Kaptein, A. A., Helder, D. I., Scharloo, M., Van Kempen, G. M., Weinman, J., Van Houwelingen, H. J., & Roos, R. A. (2006). Illness perceptions and coping explain well-being in patients with Huntington's disease. *Psychology and Health, 21*(4), 431–446.
- Kautto, E., Ivarsson, A., Norström, F., Högberg, L., Carlsson, A., & Hörnell, A. (2014). Nutrient intake in adolescent girls and boys diagnosed with coeliac disease at an early age is mostly comparable to their non-coeliac contemporaries. *Journal of Human Nutrition and Dietetics, 27*(1), 41–53.
- Keil, M. F. (2019). Patient support groups are an important component of your toolbox for patient education. *Journal of Pediatric Nursing, 44*, 137–138.
- Kichler, J. C., Kaugars, A. S., Marik, P., Nabors, L., & Alemzadeh, R. (2013). Effectiveness of groups for adolescents with type 1 diabetes mellitus and their parents. *Families, Systems & Health: The Journal of Collaborative Family Healthcare, 31*(3), 280–293.
- Kohut, S. A., Stinson, J., Jelen, A., & Ruskin, D. (2020). Feasibility and acceptability of a mindfulness-based group intervention for adolescents with inflammatory bowel disease. *Journal of Clinical Psychology in Medical Settings, 27*(1), 68–78.
- Last, B. F., Stam, H., Onland-van Nieuwenhuizen, A. M., & Grootenhuys, M. A. (2007). Positive effects of a psycho-educational group intervention for children with a chronic disease: First results. *Patient Education and Counseling, 65*(1), 101–112.
- Lawrence, M., Kerr, S., Watson, H., Paton, G., & Ellis, G. (2010). An exploration of lifestyle beliefs and lifestyle behaviour following stroke: Findings from a focus group study of patients and family members. *BMC Family Practice, 11*(1), 1–11.
- Lebwohl, B., Sanders, D. S., & Green, P. H. (2018). Coeliac disease. *The Lancet, 391*(10115), 70–81.
- Lewis, P., Klineberg, E., Towns, S., Moore, K., & Steinbeck, K. (2016). The effects of introducing peer support to young people with a chronic illness. *Journal of Child and Family Studies, 25*(8), 2541–2553.
- Lindfors, K., Ciacci, C., Kurppa, K., Lundin, K. E., Makharia, G. K., Mearin, M. L., & Kaukinen, K. (2019). Coeliac disease. *Nature Reviews Disease Primers, 5*(1), 1–18.
- Luyckx, K., Seiffge-Krenke, I., & Hampson, S. E. (2010). Glycemic control, coping, and internalizing and externalizing symptoms in adolescents With Type 1 diabetes. *A Cross-Lagged Longitudinal Approach, 33*(7), 1424–1429.
- Mackner, L. M., Ruff, J. M., & Vannatta, K. (2014). Focus groups for developing a peer mentoring program to improve self-management in pediatric inflammatory bowel disease. *Journal of Pediatric Gastroenterology and Nutrition, 59*(4), 487.
- Melita, N., Diaz-Linhart, Y., Kavanagh, P. L., & Sobota, A. (2019). Developing a problem-solving intervention to improve self-management and transition readiness in adolescents with sickle cell disease. *Journal of Pediatric Nursing, 46*, 26–32.

- Meyer, S., & Rosenblum, S. (2017). Activities, participation and quality of life concepts in children and adolescents with celiac disease: A scoping review. *Nutrients*, *9*(9), 929.
- Meyer, S., & Rosenblum, S. (2017). Development and validation of the celiac disease-children's activities report (CD-chart) for promoting self-management among children and adolescents. *Nutrients*, *9*(10), 1130.
- Mota, C. P., & Matos, P. M. (2013). Peer attachment, coping, and self-esteem in institutionalized adolescents: The mediating role of social skills. *European Journal of Psychology of Education*, *28*(1), 87–100.
- Newton, K. P., & Singer, S. A. (2012). Celiac disease in children and adolescents: Special considerations. *Seminars in Immunopathology*, *34*(4), 479–496.
- Olsson, C., Lyon, P., Hörnell, A., Ivarsson, A., & Sydner, Y. M. (2009). Food that makes you different: The stigma experienced by adolescents with celiac disease. *Qualitative Health Research*, *19*(7), 976–984.
- Plante, W. A., Lobato, D., & Engel, R. (2001). Review of group interventions for pediatric chronic conditions. *Journal of Pediatric Psychology*, *26*(7), 435–453.
- Rabaglietti, E., & Ciairano, S. (2008). Quality of friendship relationships and developmental tasks in adolescence. *Cognitie, Creier, Comportament / Cognition, Brain, Behavior*, *12*(2), 183–203.
- Rose, C., & Howard, R. (2014). Living with coeliac disease: A grounded theory study. *Journal of Human Nutrition and Dietetics*, *27*(1), 30–40.
- Sainsbury, K., Mullan, B., & Sharpe, L. (2015). Predicting intention and behaviour following participation in a theory-based intervention to improve gluten free diet adherence in coeliac disease. *Psychology & Health*, *30*(9), 1063–1074.
- Sawilowsky, S. (2009). New effect size rules of thumb. *Journal of Modern Applied Statistical Methods*, *8*(2), 467–474.
- Scheel, A., Beaton, A., Okello, E., Longenecker, C. T., Otim, I. O., Lwabi, P., & Aliku, T. (2018). The impact of a peer support group for children with rheumatic heart disease in Uganda. *Patient Education and Counseling*, *101*(1), 119–123.
- Sevinç, E., Çetin, F. H., & Coşkun, B. D. (2017). Psychopathology, quality of life, and related factors in children with celiac disease. *Jornal de Pediatria*, *93*, 267–273.
- Skjerning, H., Mahony, R. O., Husby, S., & DunnGalvin, A. (2014). Health-related quality of life in children and adolescents with celiac disease: Patient-driven data from focus group interviews. *Quality of Life Research*, *23*(6), 1883–1894.
- Smuelders, E. S., Van Haastregt, J. C., Ambergen, T., Uszko-Lencer, N. H., Janssen-Boyne, J. J., Gorgels, A. P., & Kempen, G. I. (2010). Nurse-led self-management group programme for patients with congestive heart failure: Randomized controlled trial. *Journal of Advanced Nursing*, *66*(7), 1487–1499.
- Snead, K., Ackerson, J., Bailey, K., Schmitt, M. M., Madan-Swain, A., & Martin, R. C. (2004). Taking charge of epilepsy: The development of a structured psychoeducational group intervention for adolescents with epilepsy and their parents. *Epilepsy & Behavior*, *5*(4), 547–556.
- Spirito, A., Stark, L. J., & Tyc, V. L. (1994). Stressors and coping strategies described during hospitalization by chronically ill children. *Journal of Clinical Child Psychology*, *23*(3), 314–322.
- Spirito, A., Stark, L. J., & Williams, C. (1988). Development of a brief coping checklist for use with pediatric populations. *Journal of Pediatric Psychology*, *13*(4), 555–574.
- Stewart, M., Letourneau, N., Masuda, J. R., Anderson, S., & McGhan, S. (2013). Impacts of online peer support for children with asthma and allergies: "It just helps you every time you can't breathe well." *Journal of Pediatric Nursing*, *28*(5), 439–452.
- Sverker, A., Hensing, G., & Hallert, C. (2005). 'Controlled by food'—lived experiences of coeliac disease. *Journal of Human Nutrition and Dietetics*, *18*(3), 171–180.
- Taghdir, M., Honar, N., Mazloomi, S. M., Sepandi, M., Ashourpour, M., & Salehi, M. (2016). Dietary compliance in Iranian children and adolescents with celiac disease. *Journal of Multidisciplinary Health-care*, *9*, 365.
- Torres-Ortuño, A., Cuesta-Barriuso, R., Nieto-Munuera, J., Galindo-Piñana, P., & López-Pina, J. A. (2019). Coping strategies in young and adult haemophilia patients: A tool for the adaptation to the disease. *Haemophilia*, *25*(3), 392–397.
- Varni, J. W., Seid, M., & Rode, C. A. (1999). The PedsQL™: Measurement model for the pediatric quality of life inventory. *Medical Care*, *37*(2), 126–139.
- Wagner, G., Berger, G., Sinnreich, U., Grylli, V., Schober, E., Huber, W. D., & Karwautz, A. (2008). Quality of life in adolescents with treated coeliac disease: Influence of compliance and age at diagnosis. *Journal of Pediatric Gastroenterology and Nutrition*, *47*(5), 555–561.
- Wagner, G., Zeiler, M., Grylli, V., Berger, G., Huber, W. D., Woeber, C., & Karwautz, A. (2016). Coeliac disease in adolescence: Coping strategies and personality factors affecting compliance with gluten-free diet. *Appetite*, *101*, 55–61.

- White, L. E., Bannerman, E., & Gillett, P. (2016). Coeliac disease and the gluten-free diet: A review of the burdens; factors associated with adherence and impact on health-related quality of life, with specific focus on adolescence. *Journal of Human Nutrition and Dietetics*, 29(5), 593–606.
- Wolf, R. L., Lebwohl, B., Lee, A. R., Zyburt, P., Reilly, N. R., Cadenhead, J., & Green, P. H. (2018). Hypervigilance to a gluten-free diet and decreased quality of life in teenagers and adults with celiac disease. *Digestive Diseases and Sciences*, 63(6), 1438–1448.
- Zimmer-Gembeck, M. J., & Skinner, E. A. (2016). The development of coping: Implications for psychopathology and resilience. *Developmental Psychopathology*. <https://doi.org/10.1002/9781119125556.devpsy410>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Authors and Affiliations

Melike Taşdelen Baş¹  · Hicran Çavuşoğlu²  · Ayşegül Bükülmez³ 

Hicran Çavuşoğlu
hcavusog@hacettepe.edu.tr

Ayşegül Bükülmez
aysegulbukulmez@yahoo.com

¹ Department of Nursing, Selcuk University, Akşehir Kadir Yallagöz School of Health, Konya, Turkey

² Hacettepe University Faculty of Nursing, Ankara, Turkey

³ Afyonkarahisar Medical Science Faculty of Medicine Department of Pediatrics, Afyonkarahisar Health Sciences University, Afyonkarahisar, Turkey