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Effect of solution-focused approach on problematic internet use, health behaviors in schoolchildren

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ABSTRACT

Background: Problematic internet use negatively affects adolescents' health behaviors and school success.

Purpose: This study evaluated the effects of a solution-focused approach (SFA) on adolescents' problematic internet use, health behaviors, and perceived academic success.

Methods: A randomized controlled experimental design was used with pre-test–post-test. The sample comprised 128 middle school students, with 64 in the intervention group and 64 in the control group. Data were collected using an information form, Young's Internet Addiction Test, the Nutrition–Exercise Behavior Scale, and the Nutrition–Exercise Attitude Scale. The intervention group attended six SFA group meetings.

Results: “The intervention group's, mean pre- and post-test internet addiction scores were 35.65 ± 4.43 and 17.07 ± 5.01 , respectively. There were statistically significant differences between the post test groups ($p < 0.05$) for mean internet addiction, total nutrition–exercise attitude, and total nutrition–exercise behavior and subdimension (except regular meals) scores and perceived academic success. Implications for practice and research: SFA may prevent students' uncontrolled internet use, help them gain positive health behaviors, and increase perceived academic success. The school nurse, on the other hand, may support the adolescent and their families with solution-focused interview strategies.

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Introduction

With advancements in technology, the Internet has become a significant source for learning commonly utilized in schools. Therefore, the use and popularity of the Internet has gained significant momentum among children and adolescents (Chi et al., 2020). Therefore, it is important to support the conscious use (being aware of the risks Internet) of the Internet by children and adolescents. Forasmuch as, this usage may be both beneficial and harmful (McDool et al., 2020). Uncontrolled use of information and communication technologies may cause problematic Internet use (Akkaş, 2019). This leads to an inability to limit Internet use, impaired social interactions, and decreased academic success. Nevertheless, usage continues and, in cases where access to the Internet is restricted, symptoms such as anxiety manifest themselves (McDool et al., 2020; Young & Nebuco de Abreu, 2011). Children and adolescents are the main group that is exposed to problematic Internet use (Chi et al., 2020). Smart phones give easy access to online environments and digital games in virtual environments cause children and

adolescents to spend large amounts of their time aimlessly and unproductively on the Internet (Biemesser et al., 2020; McDool et al., 2020). According to the We Are Social 2021 report, 66.6% of the global population uses the Internet for approximately seven hours a day (Digital, 2021). In Türkiye, 80.5% of people in the 16–74 age group used the Internet regularly (almost every day or at least once a week) during the first three months of 2021 (Turkish Statistical Institute, 2021). Accordingly, as the Internet usage time increases, the risk of Internet addiction increases concurrently (Karaer & Akdemir, 2019; Yayan et al., 2019). Although Internet addiction is seen in all age groups, schoolchildren are the most at risk; it has been reported that 7 to 17% of children and adolescents are at risk of Internet addiction (Chi et al., 2020; Lin et al., 2018; Pan et al., 2020). These results show that uncontrolled Internet use in adolescents is an important risk factor for Internet addiction. Relationships between students' Internet addiction and health behaviors, sleep, and low academic success have been reported (Grover & Joseph, 2020; Kaya & Dalgıç, 2021; Kumar et al., 2019; Turel et al., 2016). Therefore, it is very important to take precautions against Internet addiction for adolescents to experience healthy growth and development and increase their academic success. It is therefore important to intervene with appropriate approaches at an early stage in cases of risky behavior in children and adolescents, especially Internet

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addiction. At this point it is important for school nurses to use their position as a counselor, and for schools and families to work together (Kaya & Dalgıç, 2021). Previous studies reported the use of different approaches (Du et al., 2010; Uysal & Balci, 2018; Yang & Kim, 2018) to improve health behaviors in adolescents, increase academic success, and reduce problematic Internet usage. Unlike the previously reported interventions, this study examined the effect of using a solution-focused approach (SFA) in adolescents exhibiting problematic Internet use. SFA is a short-term, structured, and effective counseling approach. Instead of focusing on individuals' problems, it focuses on solutions of problems, strengths, and existing resources. With solution-focused thinking, people discover their strengths and realize that there are problems in life as well as solutions (Akgül Gündoğdu et al., 2016; McAllister, 2013). The stages of SFA, which are recognizing and understanding the problem, speaking the language of the individual and the language of solution, directing them to setting a goal, asking a miracle question (question for a solution), and rating and reframing, can be targeted to minimize and eliminate adolescents's problem with a solution-centered perspective (Akgül Gündoğdu et al., 2018; Hsu et al., 2020; McAllister, 2013). Thus, it can be ensured that the adolescents reduce their addictive behaviors, such as Internet addiction, to a minimum by targeting solutions and creating a daily plan to reinforce healthy lifestyle behaviors. Previous studies conducted with different age groups reported that SFA had a positive effect on Internet addiction and academic success (Busari, 2016; Zhang et al., 2020). With this viewpoint, this study aims to evaluate the effect of the SFA on Internet use, health behavior, and perceived academic success in adolescents with problematic Internet use.

The study aimed to test the following hypotheses

H1: Adolescents' nutrition–exercise attitude scores are expected to increase in the intervention group.

H2: Adolescents' nutrition–exercise behavior and subdimension scores are expected to increase in the intervention group.

H3: Adolescents' total Internet addiction scores are expected to decrease in the intervention group.

H4: Perceived academic success by adolescents is expected to be good in the intervention group.

Methodology

Study design

This study used a pre-test–post-test experimental design with a randomized control group to evaluate the SFA group meeting technique.

Setting and sample

The study was conducted between February and May 2019. The study was carried out in a secondary school selected from among secondary schools located in Sivas city center in Turkey using a simple random sampling method. The sample size was calculated using the G*Power 3.1.9.2 analysis program. Sample size was determined based on the Internet addiction scale score (26.82 ± 8.59) (Demir & Kutlu, 2018), with an effect size of 0.50, 80% power, and 5% margin of error for a total of 128 students (64 in the intervention and 64 in the control group).

A total of 353 students were evaluated to determine the status of Internet use among children and adolescents at the time of this survey. 317 students agreed to participate in the study [Declined to participate ($n = 12$), other reasons (group with special needs) ($n = 24$)]. Young Internet addiction, <30 , $n = 189$, %59.7; young Internet addiction, >30 , $n = 128$, %40.3. (Fig. 1). Based on the Internet scale score, the power of the test was found to be 100% with the difference between the pre- and post-test groups at a confidence level of 0.95.

Inclusion criteria were being aged 11–14 years, receiving a score of 30 and above on the Young Internet Addiction Scale (Pawlikowski et al., 2013), being able to communicate, and not being diagnosed with a mental illness. *Exclusion criteria* were moving out of the province, and not attending at least two meetings (Fig. 1).

Study instruments and primary and secondary outcome measures

The primary outcome was the adolescents' mean problematic Internet use score. This was evaluated during the pre- and post-test after the intervention (at 3 months) using the Young Internet Addiction Scale. The secondary outcomes were the mean exercise behavior and attitude score and perceived academic success. The exercise behavior and attitude score were evaluated during the pre-test and the post-test after intervention (at 3 months) using the Exercise Behavior and Attitude Scale. Perceived academic success was self-reported by the adolescents.

Randomization

The adolescents were selected based on the inclusion and exclusion criteria and then assigned a random number. The total number of students was entered into the website <http://www.randomizer.org/form.htm> and the students were then randomly divided into two groups of 64 each. These two groups were determined as intervention and control group with the lottery method. All these steps were carried out by an independent statistician. This was a “single blind” study so the adolescents did not know which group they were placed in.

Study instruments

Data were collected using a descriptive characteristics form, Young's Internet Addiction Test, the Nutrition–Exercise Behavior Scale, and the Nutrition–Exercise Attitude Scale.

Descriptive characteristics form

The form was created by the researchers in line with the literature (Yurt et al., 2016; Yurt & Yildiz, 2016) and consists of seven questions (gender, age, family income status, educational status of the mother, educational status of the father, perceived academic success, BMI).

Young's internet addiction test

The test was developed by Young (1998). It was transformed into the short form by Pawlikowski et al. (2013). Turkish validity and reliability study was conducted by Kutlu et al. (2016). The scale's Cronbach alfa reliability coefficient for adolescents was determined as 0.86 (Kutlu et al., 2016). The 5-point Likert scale (1 = never, 5 = very often) consists of 12 items with no reverse scoring. A score of >30 indicates problematic Internet use (Pawlikowski et al., 2013).

Nutrition–Exercise Attitude Scale (NEAS)/ Nutrition–Exercise Behavior Scale (NEBS)

The reliability and validity of these scales were evaluated by Yurt et al. (2016a; 2016b). While there were no reverse-scored items in the NEAS, items 7–12, 14, 15, 17, 18, 20, 22, 30–32, 34–39, 42, and 43 were scored in reverse in the NEBS. High scores from the scales indicated that a positive attitude and behavior towards nutrition–exercise was developed (Yurt et al., 2016; Yurt & Yildiz, 2016).

The nutrition–exercise behavior scale had four subdimensions: psychological (addicted) eating behavior (11 items: 7, 8, 10, 20, 22, 34, 35, 36, 37, 38, 39), healthy nutrition–exercise behavior (14 items: 13, 16, 19, 23, 24, 25, 26, 27, 28, 33, 40, 41, 44, 45), unhealthy nutrition–exercise behavior (14 items: 9, 11, 12, 14, 15, 17, 18, 21, 29, 30, 31, 32, 42, 43), and regular meals (6 items: 1, 2, 3, 4, 5, 6). The Cronbach's

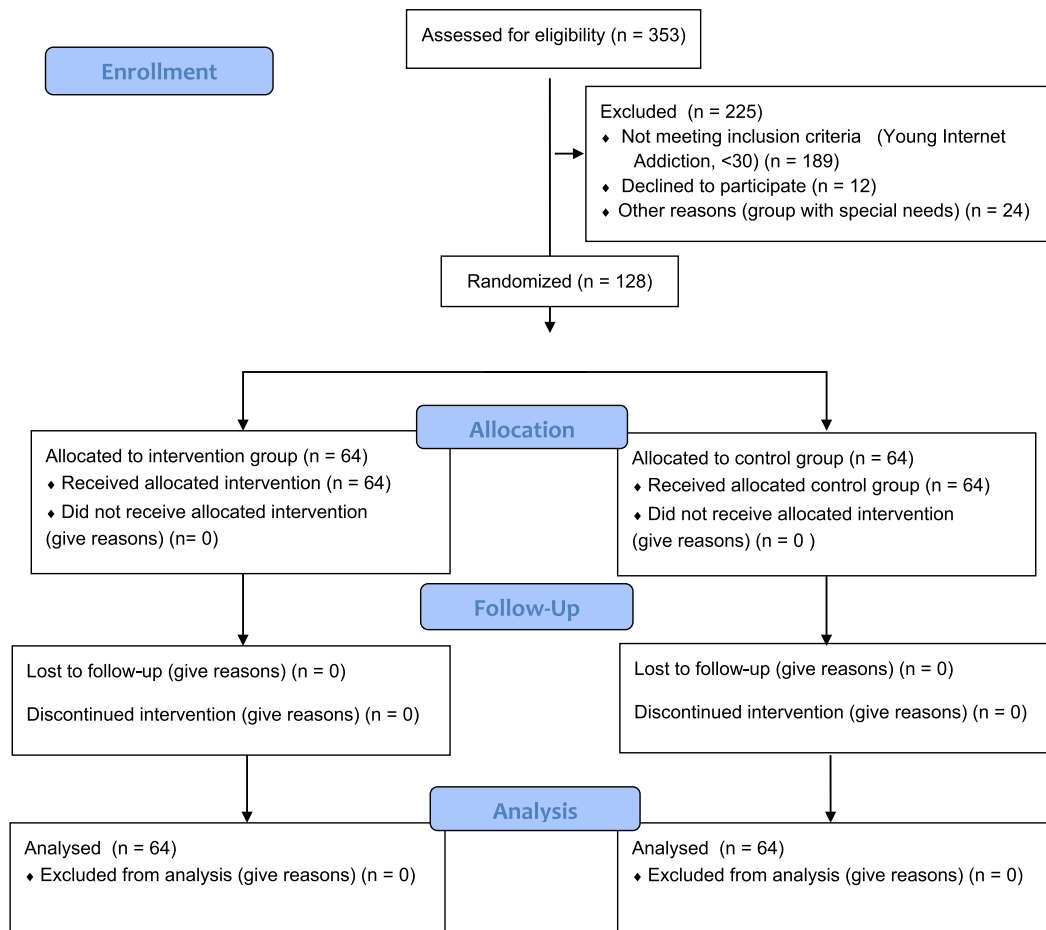


Fig. 1. CONSORT diagram: flow of participants through the study.

alpha values for the NEAS and NEBS were 0.74 and 0.85, respectively (Yurt et al., 2016).

Variables of the Study: The study's independent variable was the SFA, while the dependent variables were problematic Internet use, nutrition–exercise behavior and attitude, and perceived academic success and the control variables were the descriptive characteristics of the students.

Interventions

Intervention group

SFA Meetings. The SFA offers an approach that focuses on the solution itself, rather than focusing on solving the problem as a separate method that repeatedly directs the individual to the solution. In addition, the SFA enables individuals to realize the exceptional situations, strengths, and existing resources about themselves (Akgul Gundogdu et al., 2016; McAllister, 2013). In the SFA meetings, which were applied to four different groups (SFA application (four separate groups (n = 16) 6 group interviews), the purpose and process of the interviews were explained to the school children in each group, and the groups were asked to express their thoughts on the use of the Internet. In line with SFA strategies, the “Magic Sphere”, “Letter Writing”, “Miracle Question”, “Exceptional situation question”, “Cheerleading effect/compliment”, “Grading”, and “Homework” techniques were used in the group meetings.

Adolescents do not accept easily that they have an addiction and do not tend to express their ideas to the other people if they are not their

peers. Also, they do not accept easily that they need to change their behavior (Preydea et al., 2020). Therefore, using SFA strategies, the students with problematic Internet use in the groups were encouraged to express what they wanted to achieve regarding their Internet use, and the students were directed to set goals. In the next group meeting, the students were asked to express what they thought about uncontrolled Internet use since the first meeting and what they could have done that could be perceived as “better”. With the “Letter writing technique” students were encouraged to reveal their internal (skills, strengths, abilities, indoctrination, self-ordering, self-help, etc.) and external resources (people with whom they can establish supportive relationships; family, friends, teachers, counselors, etc.). Furthermore, with the “miracle question technique” the students were asked to clarify and concretize their objectives for solving their problems. The aim of the “Exceptional situation question” technique was to emphasize the times when students use the Internet intensively or not at all and to reveal the resources they use to solve this problem. The group was asked exceptional situation questions that would reveal differences in nutrition–exercise behaviors and academic success when they used the Internet intensively and when they used the Internet less. With the “Coping questions” the students expressed what they found useful in dealing with this problem and what coping methods they used. With the “Cheerleading effect/compliment” technique, it was ensured that the school children in each group were able to recognize the times, situations, and coping methods that enabled them to overcome their Internet addiction, and to reinforce and maintain these positive behaviors. The aim of the “Grading technique” was to determine the extent to which the determined goals and given homework were completed or to determine

how effective students are in problem-solving by drawing attention to changes. With the “Homework” technique it was ensured that the students watched themselves and discovered differences in themselves and their environment when the problem was not experienced. In each stage of the process, more than one SFA meeting technique was used. The families of the students who were part of the group meetings were also spoken to about problematic Internet use and its harms, the responsibilities of the family, and the arrangement of the home environment.

After the students were selected according to the inclusion and exclusion criteria, (11–28 February 2019), the students in the intervention groups (four groups of 16) attended meetings every 2 weeks (30–45 min per meeting) for six sessions (March 1–May 31, 2019) and the SFA group meeting techniques were applied (Fig. 1). Meetings with the intervention group were conducted by the first author in the school setting. They were held in the classroom environment during the appropriate class hours (Monday and Wednesday, 10.00–11.00) determined together with the guidance teacher according to the students' schedule. The meetings with the group were conducted by the same person, at the same time, in line with the same SFA strategies.

Control group. The students that were assigned to the control group and who completed the pre-test did not receive any intervention from the start until the end of the application. After the study, the control group also attended SFA group meetings.

The descriptive characteristics form, Young's Internet addiction test, NEAS, and NEBS were applied to both groups for the pre-test and all scales, excluding the descriptive characteristics form, were applied again for the post-test.

Ethical considerations. Approval to conduct the study was obtained from the University Clinical Research Ethics Committee and written permission was obtained from the institution where the study would be conducted (2019-02/63). The school children and their families who participated in the study were informed about the study and their written consents were obtained.

Data analysis. The statistical program IBM SPSS 22 was used for the analysis of the data. The conformity of the data to normal distribution was evaluated using the Kolmogorov–Smirnov test and Q-Q plots. Number, percentage, mean, and standard deviation were used for descriptive statistics. In the comparison of the mean scores of the scales (Internet addiction test/primary outcome; Nutrition–Exercise Attitude Scale, Nutrition–Exercise Behavior Scale/secondary outcome) for the control and intervention groups, t-test was used in independent groups because the data were normally distributed. Wilcoxon analysis was used to compare the mean scores between the baseline and post-intervention measurements since the data did not follow a normal distribution. The homogeneity between the groups in terms of independent variables and the perceived academic success (secondary result) baseline and post-intervention were evaluated by chi-squared analysis. The statistical significance level was accepted as $p > 0.05$.

Results

Descriptive characteristics

Comparison of the adolescents' descriptive characteristics showed that there were no significant differences between the intervention and control groups in terms of gender, age, family income status, educational status of the father and mother, perceived academic success, or BMI ($p > 0.05$). The mean age of the adolescents in the intervention group was 11.34 ± 1.12 and the mean age of those in the control group was 11.98 ± 1.18 (Table 1).

Table 1

Comparison of the descriptive characteristics of the adolescents in the intervention and control groups.

Characteristics	Intervention group (n = 64)		Control group (n = 64)		χ^2	p
	N	%	n	%		
Gender*						
Female	22	34.4	25	39.1	0.103	0.74
Male	42	65.6	39	60.9		
Age*						
10–11 years	18	28.1	13	20.3	3.369	0.06
12–15 years	46	71.9	51	79.7		
Family income status*						
Low	7	10.9	7	10.9	1.696	0.79
Moderate	52	81.3	49	76.6		
High	5	7.8	8	12.5		
Educational status of the mother*						
Primary school	30	46.9	29	45.3	0.753	0.94
Middle school	19	29.7	18	28.1		
High school and higher	15	23.4	17	26.6		
Educational status of the father*						
Primary school	20	31.3	18	28.1	2.372	0.66
Middle school	17	26.6	19	29.7		
High school and higher	27	42.2	27	42.2		
Perceived academic success						
Good	33	51.6	30	46.9	5.479	0.24
Moderate	5	7.8	6	9.4		
Bad	26	40.6	28	43.6		
	$\bar{x} \pm SD$		$\bar{x} \pm SD$			
BMI	26.38 ± 6.79		24.03 ± 5.91		$t = 1.203$	0.57

χ^2 : Chi-squared test, t: t-test between independent groups, $p < 0.05$.

* Yates' corrected chi-squared analysis was performed because the observed number of eyes was < 25 .

Internet addiction

While a significant difference was found between the mean pre- and post-test Internet addiction scores in the intervention group ($p < 0.01$), no significant difference was found in the control group ($p > 0.05$, Table 2).

There was no significant difference between the intervention and control groups in terms of their mean pre-test Internet addiction scores ($p > 0.05$). However, a statistically significant difference between the groups in terms of the adolescents' mean Internet addiction scores was found in the post-test ($p < 0.05$).

Nutrition–exercise attitude

While a significant difference was found between the total mean pre- and post-test nutrition–exercise attitude scores in the intervention group ($p < 0.05$), no significant difference was found in the control group ($p > 0.05$). In the post-test the difference between the total mean scores of the adolescents' nutrition–exercise attitude scale between the groups was found to be statistically significant ($p < 0.05$). (Table 3).

Nutrition–exercise behavior

Significant differences were found between the intervention (excluding psychological (addicted)) and control (excluding the healthy nutrition–exercise behavior subdimension mean score) groups in terms of pre- and post-test mean total nutrition–exercise behavior, psychological (addicted) eating behavior subdimension, and unhealthy/healthy nutrition–exercise behavior subdimension scores ($p < 0.05$), (Table 3).

Comparisons between and within groups showed no statistically significant differences between the regular meals subdimension mean

Table 2
Comparison of the mean internet addiction test scores of the adolescents in the intervention and control groups.

Variable	Intervention group (n = 64) $\bar{x} \pm SD$	Control group (n = 64) $\bar{x} \pm SD$	Statistical Analysis	p(intergroup)
Internet Addiction Test				
Pre-test	35.65 ± 4.43	34.23 ± 4.79	t = 0.026	0.084
Post-test	17.07 ± 5.01	37.18 ± 5.27	t = 0.983	0.001*
Z*	1.421	0.675		
p	0.001*	0.561		

* p < 0.01, Z: Wilcoxon test, t-test between independent groups.

scores of the nutrition–exercise behavior scale obtained from the pre- and post-tests (p > 0.05) (Table 3).

Perceived academic success

While there was no significant difference between the intervention and control groups for the initial perceived academic success levels of the adolescents (p > 0.05), the difference between the perceived academic success levels of the adolescents in the intervention and control groups was found to be statistically significant in the post-test (p < 0.01) (Table 4).

Discussion

School nurses guide adolescents and their families towards positive health behaviors. In this regard, nurses should consult the adolescents and their parents about healthy Internet use and strengthen the adolescents and families with effective strategies for healthy Internet use. In addition, the primary purpose of the school nurse should be ensuring behavioral changes in adolescents through interventions. Therefore,

this study aimed to evaluate the effect of the SFA on adolescents' problematic Internet use, health behaviors, and perceived academic success.

A significant difference was found between the groups in terms of the mean Internet addiction scores of the adolescents after the intervention (Table 2). Similarly in terms of the outcome variable, studies using different intervention programs reported that they were effective in reducing Internet addiction tendencies in adolescents (Çelik, 2016; Uysal & Balci, 2018; Yang & Kim, 2018). While these studies are similar to the current study in terms of the outcome variable examined (Internet addiction, problematic Internet use), they differ in terms of the research design (quasi-experimental), the intervention program used (structured training program to reduce Internet addiction) and the scales used. In these studies, different scales were used for the same purpose in outcome variables (Internet addiction, problematic Internet use). In line with these results, it could be argued that intervention programs can contribute to healthy Internet use in adolescents (Çelik, 2016; Uysal & Balci, 2018; Yang & Kim, 2018). However, the type of intervention programs in these studies may differ in terms of reducing Internet use/problematic Internet use and maintaining the long-term effect of the training programs.

Table 3
Comparison of the mean total nutrition–exercise attitude scores, mean nutrition–exercise behavior scale subdimension scores, of the adolescents in the intervention and control groups.

Scales	Intervention group (n = 64) $\bar{x} \pm SD$	Control group (n = 64) $\bar{x} \pm SD$	t-value	p(intergroup)
<i>Nutrition–exercise attitude total</i>				
Pre-test	43.81 ± 7.98	41.39 ± 7.50	0.954	0.331
Post-test	47.40 ± 10.84	40.40 ± 8.95	9.236	0.003*
Z-Value	3.012	2.923		
p	0.02**	0.35		
<i>Nutrition–exercise behavior total</i>				
Pre-test	147.59 ± 20.58	144.76 ± 20.26	0.123	0.726
Post-test	154.35 ± 23.68	136.56 ± 23.16	1.394	0.024**
Z-Value	0.328	5.026		
p	0.010**	0.02**		
<i>Psychological (addicted) eating behavior</i>				
Pre-test	33.65 ± 7.87	32.23 ± 8.42	0.439	0.509
Post-test	34.32 ± 9.35	27.56 ± 9.79	1.726	0.019*
Z-Value	2.027	5.291		
p	0.48	0.002*		
<i>Healthy nutrition–exercise behavior</i>				
Pre-test	45.73 ± 10.65	45.70 ± 9.86	0.892	0.347
Post-test	49.48 ± 9.53	44.93 ± 7.99	2.120	0.002*
Z-Value	0.093	1.235		
p	0.044**	0.078		
<i>Unhealthy nutrition–exercise behavior</i>				
Pre-test	45.06 ± 7.90	43.79 ± 6.26	3.099	0.081
Post-test	45.17 ± 8.18	39.87 ± 6.87	9.649	0.011**
Z-Value	2.543	3.092		
p	0.037**	0.006*		
<i>Regular meals</i>				
Pre-test	23.14 ± 4.47	23.03 ± 4.90	1.370	0.244
Post-test	25.37 ± 3.46	24.18 ± 3.84	1.194	0.277
Z-Value	1.952	5.278		
p	0.093	0.438		

*p < 0.01, **p < 0.05.

Z: Wilcoxon test, t: t-test between independent groups.

Table 4
Comparison of the perceived academic success levels of the adolescents in the intervention and control groups.

Variable	Intervention group (n = 64) Number (%)	Control group (n = 64) $\bar{x} \pm SD$	χ^2	p
Perceived Academic Success				
Pre-test				
Good	33 (51.6%)	30 (46.9%)	5.479	0.24
Moderate	26 (40.6%)	28 (43.8%)		
Bad	5 (7.8%)	6 (9.3%)		
Post-test				
Good	54 (84.4%)	10 (15.6%)	14.844	0.001*
Moderate	10 (15.6%)	38 (59.4%)		
Bad	–	16 (25.0%)		

χ^2 : Chi-squared test, *p < 0.01.

In a randomized controlled study, which was different from the current study in terms of intervention, cognitive behavioral therapy (CBT) was applied to the intervention group to improve adolescents' Internet addiction. No difference in terms of Internet usage scores was found between the intervention and control groups in the beginning, immediately after the intervention, and in 6 months follow-up. In addition, although Internet use decreased in both groups, only the intervention group showed improved time management skills and better emotional, cognitive, and behavioral symptoms (Du et al., 2010). In a meta-analysis study, it was reported that group counseling programs, cognitive behavioral therapy (CBT) and sport interventions reduced problematic Internet use (Liu, Nie, & Wang, 2017). In studies conducted with university students as a different sample group it was determined that the solution-focused approach was more effective than the guidance group and the control group for increasing healthy Internet use (Sağar & Özabacı, 2022). A pilot study used solution-focused group counseling to improve moderate to high levels of Internet addiction symptoms of college students. The results suggested that solution-focused group counseling had positive effects on Internet addiction and was generally positively valued by participants. SFA has the characteristics of high-efficiency, simplicity, and durability in intervening with college students' Internet use (Zhang et al., 2020). The program used may have helped students discover their strengths for healthy Internet use and to regulate their Internet usage habits. At the same time, it may have contributed to gaining a more positive perspective on healthy Internet use by students.

Another problem associated with problematic Internet use of adolescents is low academic success. When their minds are preoccupied with the Internet, students are less motivated towards their academic responsibilities (Demir & Kutlu, 2018). This study found a significant difference between groups in the perceived academic success status of the adolescents after the intervention (Table 4). Similar to this result, it was reported that the SFA in high school students significantly increased the academic success in the intervention group (Saadatzaade & Khalili, 2012). Another study (Çelik, 2016) used concepts such as attention, motivation, and efficient study to increase the academic motivation of adolescents and prevent them from focusing on the Internet, as part of the prepared education program. As a result, they achieved increased academic motivation in the adolescents (Çelik, 2016). In a non-randomized experimental intervention study conducted on adolescents with Internet addiction, it was reported that a solution-focused social interest program was effective in the management of academic stress and Internet addiction. The intervention program of this study, unlike the current study, consisted of 6 sessions and eight hours per week (Busari, 2016). Sitindaon and Widiana (2020) reported that the solution-focused group counseling program applied in an intervention study with university students was effective in reducing academic stress levels.

It is seen that academic success, which is negatively affected by risky behaviors such as Internet addiction in adolescence, may be controlled

with professional support. The focus at this stage is to get the adolescent ready to receive this professional support. In order to achieve this, it can be effective to plan meetings with solution-focused approach strategies.

Adolescents become addicted as they cannot limit their Internet use to the required rate, which also affects their health behaviors. This leads to health problems, inactivity, weight gain, and changing eating habits due to inactivity (Kojima et al., 2019). Özen et al. (2018) reported that 44.3% of adolescents used the Internet for more than five hours a week, 32.8% skipped eating while on the Internet, 13.4% were obese, and those that were obese had higher mean Internet addiction scores. Another study found that the SFA increased the mean nutrition-exercise attitudes and behavior scores in adolescents, and was effective in reducing weight and BMI percentiles. The research design of this study (randomized controlled trial) is similar to the current study. However, unlike the current study, in this study, eight solution-focused interviews were conducted with each adolescent at 2-week intervals (interview length 30–45 min) (Akgül Gündoğdu et al., 2018). Unhealthy behaviors (unhealthy diet, inactivity, etc.) that are not intervened during adolescence may reduce the capacity to cope with the problem in adulthood. The health of adolescents who have an unhealthy lifestyle may be adversely affected in later ages. However, in this period, adolescents having healthy lifestyle behaviors with the effect of approaches such as SFA may change their attitudes towards nutrition-exercise behaviors and adolescents can acquire positive health behaviors.

Practice implications

The health behaviors and academic achievements of adolescents with unhealthy and risky behaviors are also negatively affected. Thus, controlling the problematic Internet use of adolescents is extremely important for adolescents to have a healthy adulthood. The school nurse, who provides this control, may support the adolescent and their families with solution focused interview strategies. This control would protect the adolescent from unhealthy behaviors and low academic achievement.

Limitations

As this study was conducted with secondary school students, it has sample limitations. The results of the study cannot be generalized because external validity could not be achieved, but it may contribute to generalization. Students are likely to be influenced by each other because they attend the same school. The questionnaires are self-reported, which is a limitation. Another limitation of the study is that academic success was not evaluated as grades. The academic success levels perceived by the students were evaluated using the question, "How would you rate your academic success?" It is recommended to consider school grade point averages rather than perceived academic success for future studies. In addition, no repeated follow-ups were made after the intervention.

In addition, there could be problematic Internet use in school-age children during processes such as the Covid-19 pandemic. Such cases demonstrate the need for interventional studies such as the current study. Thus, the effectiveness of nursing intervention conducted in this study point at its strength.

Conclusions

It was determined that in the three-month period of the SFA meetings, the mean Internet addiction scores decreased while the mean nutrition-exercise attitude and behavior scores increased. In this regard, it could be argued that solution-focused group meetings can control the Internet use of students with a particularly high level of Internet addiction, help students develop healthy lifestyles according to their healthy nutrition-exercise behaviors, and increase their perceived academic success. In addition, the long-term effects of SFA were not

evaluated for this study. It may be recommended to evaluate the long-term effects of SFA for future studies.

CRedit authorship contribution statement

Design of Study: A-G N, S-T A.

Data Collection: A-G N.

Analysis: S-T A.

Preparation of Manuscript: A-G N, S-T A.

All authors approved the final version for submission.

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Declaration of Competing Interest

The authors declare that they have no conflicts of interest.

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