Medicine®

Impact assessment of a primary care physician counseling program for youth population

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Abstract

This study aimed to investigate the impact of implementing a primary care physician (PCP) counseling program for the youth population with healthcare needs. This quasi-experimental study used a nonequivalent control group pretest-posttest design, and was conducted at Salim Health Innovation Clinic in Seoul between February and October 2019 comprising 46 participating youths (intervention group) and 48 nonparticipating youths (control group). After 6 months of implementation, drinking (alcohol use control) decreased significantly in the intervention group (0.84 points). There was a significant difference in the anxiety level with a decrease of 2.86 and 0.65 points in the intervention and control groups (P = .011) respectively. There was also a significant difference in the health responsibility domain (P = .04). Moreover, a significant difference in self-efficacy level was found with a mean increase of 0.18 and 0.16 points in the intervention and control groups (P = .001), respectively. The youth population is more prone to neglect self-care due to poor physical and mental health status and no hope for the future because of a lack of jobs and rising housing prices. The program reinforces health-promoting behavior for managing stress and practicing eating high-quality meals, regular exercise, and regular health screening, which can help implement continuous and effective healthcare.

Abbreviations: PCP = primary care physician, SMC = seoul medical center.

Keywords: counseling, health-promoting behavior, primary care physician

1. Introduction

The proportion of the youth population in South Korea is decreasing, whereas that of older adults is increasing due to structural changes resulting from low fertility and aging. The youth population faces a heavy burden due to various socioeconomic conditions, including low economic growth and deepening income disparity. The youth population is considered to have good health and vitality, despite the recent and rapid decline in health among youths aged 20 to 39 years. According to statistical data on medical expenses, the change rate in healthcare costs by age has increased steadily among individuals aged 20 to 39 years. In 2019, the increase rate among individuals aged 20 to 29 and 30 to 39 years was 9.30% and 7.64%, respectively. The rate of increase was higher among the youth than that among individuals aged 40 to 49 years (7.40%).[1] Statistics showed that suicide was the most common cause of death for 2020 among individuals aged 20 to 29 years, followed by cancer-related death and traffic accident death. Whereas among individuals aged 30 to 39 years, suicide was followed by cancer-related death and heart disease. This suggests that the younger generation also needs health care in case of cancer or heart disease. This indicates the need for health warning signs, not only for older generations, but also

for younger generations, for whom cancer and heart disease are becoming increasingly prevalent.[2]

Younger generations are required to make many sacrifices, specifically socially. As a result, they are experiencing stress that is affecting their physical and mental health. This requires practical solutions. Moreover, the health indicator that best demonstrates the health of individuals aged 20 to 39 years is gastrointestinal disease. The second most common cause of death among them is cancer. Among those aged 20 to 29 years, gastric cancer, along with colorectal cancer (0.3 per 100,000 population; 2019–2020), is the third most common cause of death, following leukemia (0.9/100,000) and brain cancer (0.5/100,000). Among those aged 30 to 39 years, gastric cancer (1.8/100,000) is the second most common cause of death, following only breast cancer (1.9/100,000).[2] Gastric cancer is caused by environmental and genetic factors, while its high incidence can be attributed to environmental factors. Younger generations often lack time and money but are pressured to prepare meals while balancing academics or employment. This has increased the inability of young people to have proper meals. Regarding problems when eating alone, over 55% showed a tendency to not eat properly with 35.8% eating simple meals and 19.2% eating mostly instant foods.[3] These dietary habits increase the risk of gastric cancer from consuming foods that are not fresh and contain high salt or nitrate content. Moreover,

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the prevalence of obesity was 34.7% among individuals who ate 3 meals a day alone, approximately 10% higher than that among those who ate more than 3 meals.[4]

Health deterioration among the youth population is not limited to their physical health. The most common cause of death among individuals aged 20 to 39 years is suicide, demonstrating that they are exposed to mental health risks.[2] With the spread and prolongation of coronavirus disease 2019 (COVID-19), there has been a rapid surge in "Corona Blues" from reduced face-to-face contact and the disruption of various occupational activities. The number of patients with depression was estimated to be approximately 830,000 in 2020, representing an increase of 30% as compared with 640,000 in 2015. The age group that showed the highest increase was 20 to 29 years, from approximately 65,000 in 2016 to approximately 147,000 in 2020.[5] This proves that the younger generations' mental health has been considerably negatively impacted. Despite struggling with insomnia or depression, the younger generation finds it difficult to seek psychiatric help due to psychological resistance, cost, and time.[6]

Health-promoting behaviors refer to behaviors that focus on satisfying and maintaining personal needs and self-actualization while achieving an optimal state of well-being. These are affected by various factors. Health belief is a major influencing variable of health-promoting behavior,[7] while self-efficacy has a direct influence on practicing it.[8] Health belief is a key factor for predicting and explaining health-related behaviors, which shows behavioral assessment for predicting future outcomes from practicing healthy behaviors and perceived threats that predict the diseases that may occur.[9] Self-efficacy represents the confidence of successfully practicing healthy behaviors, which can influence health-related behaviors.[10] This study aimed to implement a primary care physician (PCP) counseling program for the youth population with healthcare needs and identify the impact of such a program.

2. Methods

2.1. Study design

This quasi-experimental study used a nonequivalent control group pretest-posttest design to identify the effects of the PCP counseling program for the youth population on lifestyle habits, mental health, social support, health-promoting behaviors, health belief, self-efficacy, and health status. The participants in the intervention group completed 55 items of a blood test, urinalysis, and questionnaire survey, after which, they participated in the program at least once a month for 6 months. Moreover, the "posture innovation project" training was applied, which comprised 4 lecture sessions on understanding healthy posture, the posture that fits one's body, and creating a body portfolio, as well as 8 small-group practical training sessions on posture diagnosis and problem-solving. Upon completion, the participants completed the same items of a blood test, urinalysis, and

questionnaire survey as in the pretest. The participants in the control group also completed the same pretest items at the beginning and the same posttest items after 6 months (Table 1). The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of Seoul Medical Center (SMC 2019-02-001-001). Informed consent was obtained from all subjects involved in the study. Written informed consent was obtained from the patients to publish this paper.

2.2. Participants

The study population comprising individuals aged 19 to 39 years was divided into youths participating (intervention group, n = 46) and not participating in the PCP counseling program (control group, n = 48). The study period was between February and October 2019. The G-Power 3.1.7 program was used to calculate the sample size based on a moderate effect size of 0.6, a significance level of 95%, and statistical power of 80% used in a precedent study.[11] The results indicated that a sample size of 40 participants was needed for each group.

2.3. Study tools

2.3.1. Lifestyle habits. For the assessment of lifestyle habits, the national health screening tool was referenced and used.[12] Regarding smoking status, the participants were asked about past smoking habits and how long they had smoked, current smoking habits, intention and confidence to quit, and nicotine dependence. For drinking status, the WHO tool[13] was used, which comprised items regarding at-risk drinking, symptoms of alcohol dependence, and harmful drinking. For exercise status, the physical activity level was assessed based on questions regarding activity within the past 7 days.[14] For nutritional status, the healthy diet indicator developed by Kim et al[15] for identifying the dietary quality among South Koreans was used. For sleep, quality assessment was mostly performed, and the Korean version of the Pittsburg Sleep Quality Index was used for measurement.[16] It is a tool used to measure subjective sleep quality over a 1-month time interval, comprising items regarding subjective sleep quality, latency, duration, disturbance, habitual sleep efficiency, use of sleeping medication, and daytime dysfunction. The reliability (Cronbach's α) of the tool was 0.83 at the time of development and 0.80 in this study.

2.3.2. Mental health and social support assessment. Depression was measured using the version of the Patient Health Questionnaire-9 (PHQ-9) originally developed by Kroenke et al[17] and subsequently adapted and standardized into Korean by Donnelly.[18] It measures the depression level over the last 2 weeks and is useful for screening and assessing the severity. The tool includes items regarding anhedonia, depression, sleep, fatigue, appetite, guilt, worthlessness,

Table 1

Study design details.

Pretest	Intervention (6 mo)		Posttest
General characteristics	Intervention group	Control group	Anthropometric measurements
Anthropometric measurements	PCP counseling program	Regular care	Blood test
Blood test	(Individual counseling, at		Urinalysis
Urinalysis	least once a mo)		Lifestyle habits (smoking, drinking, exercise, nutrition,
Lifestyle habits (smoking, drinking, exercise, nutrition, and sleep)	Group training		and sleep)
Depression and anxiety	(4 lectures and 8 small-		Depression and anxiety
Social networks Health-promoting behavior	group exercises)		Social networks Health promoting behavior
Health belief			Health belief
Self-efficacy			Self-efficacy

concentration, psychomotor agitation/retardation, and suicidal ideation over the last 2 weeks. The reliability (Cronbach's α) was 0.89 at the time of development, 0.92 in the study by Donnelly,[18] and 0.80 in this study. Anxiety was measured using the version of the Beck Anxiety Inventory originally developed by Beck et al and subsequently adapted into Korean by Kwon.[19] The tool measures the anxiety level experienced over the last week, and it includes items in cognitive, emotional, and physical domains. The reliability (Cronbach's α) of the tool was 0.91 in the study by Kim and Yook[20] and 0.89 in this study. The Lubben Social Network Scale was used to measure participants' social networks,[21] which measures relationships for exchanging continuous emotional, information, goods, and services assistance through social contact with family, relatives, neighbors, and friends. Its reliability (Cronbach's α) was 0.78 in this study.

2.3.3. Health-promoting behavior.
This study used the version of the Health Promoting Lifestyle Profile II originally developed by Walker et al[22] and subsequently modified and supplemented by Eom.[23] It includes items regarding physical activity, nutrition, spiritual growth, health responsibility, interpersonal relationships, and stress management. Its reliability (Cronbach's α) was 0.94 at the time of development and in this study.

2.3.4. Health belief.
The version of the tool developed by Walker et al[22] and subsequently adapted into Korean by Lee[24] was used. This tool includes items regarding perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers. The reliability (Cronbach's α) was 0.92 at the time of development and 0.71 in this study.

2.3.5. Self-efficacy.
Self-efficacy was measured using the version of the tool developed by Sherer et al[25] and subsequently adapted into Korean by Kim et al[26] Its reliability (Cronbach's α) was 0.90 in the study by Kim et al[26] and 0.96 in this study.

2.4. Data collection method

For data collection, approval was obtained from the Institutional Review Board of Seoul Medical Center (SMC 2019-02-001-001). After providing information regarding the objective and anonymity, an informed consent form was obtained from each participant. The study was conducted between February and October 2019. The initial study population comprised 46 and 48 participants, although the study was completed with 44 and 41 participants in the intervention and control groups, respectively, due to dropouts (moving, change of job, enlistment in the military, and so on).

2.5. Data analysis method

The SPSS 21 statics program was used to perform statistical analysis on the health screening and questionnaire survey results. For the statistical analysis, basic statistical analysis, chi-square test, paired t test, and unpaired t test were performed.

3. Results

3.1. General characteristics

The mean age of the participants in the intervention and control groups was 32.5 and 30.8 years respectively. There was no significant difference observed between the 2 groups comprising participants aged 19 to 39 years (Table 2). Regarding sex, there were 5 males (11.4%) and 39 females (88.6%) in the intervention group and 8 males (19.5%) and 33 females (80.5%) in the control group. Both groups had a higher percentage of females, although there was no significant difference according to sex. Regarding marital status, 30 participants (68.2%) were

single and 12 (27.3%) were married in the intervention group, whereas 30 (73.2%) were single and 8 (19.5%) were married in the control group. Regarding the highest education level, the number of participants who completed university, graduate school, college, and high school was 26 (59.1%), 13 (29.5%), 2 (4.5%), and 3 (6.8%) in the intervention group, respectively, and 29 (70.7%), 6 (14.6%), 3 (7.3%), and 3 (7.3%) in the control group, respectively. There were no significant differences in marital status and highest education level (Table 2). Regarding employment status, most participants in both groups were employed. The number of participants with regular, non-regular, part-time, and no employment was 23 (52.3%), 7 (15.9%), 7 (15.9%), and 7 (15.9%) in the intervention group, respectively, and 25 (61.0%), 9 (22.0%), 5 (12.2%), and 2 (4.9%) in the control group, respectively. For participants in the intervention group, the mean height was 162.02 cm, and the mean weight was 62.96 kg, while 31 participants (70.5%) had a body mass index ranging from 18.5 to 24.9 kg/m². In the control group, the participants' mean height was 163.93 cm and mean weight was 60.19 kg, while 33 (80.5%) had a body mass index ranging from 18.5 to 24.9 kg/m². Moreover, the mean number of visits to PCP during the last 6 months was 14.2 and 5.8 times in the intervention and control groups, respectively. The participants in the intervention group received care that included the PCP counseling program, whereas those in the control group received regular care.

3.2. Effects of the PCP counseling program on lifestyle habits

For drinking status, scores of 0 to 7, 8 to 14, 15 to 25, and ≥ 26 points were considered as indicating normal drinking, at-risk drinking, alcohol abuse, and alcohol dependence, respectively. The mean score in the intervention group decreased from 4.25 points at pretest to 3.40 points at posttest (P = .081), while that in the control group decreased significantly from 6.02 points at pretest to 5.41 points at posttest (P = .045). Regarding pretest-posttest change, the intervention group showed a more significant decrease of 0.84 points, as compared with 0.61 points in the control group (P = .007). Nutritional status was assessed based on 55 potential points. The mean score increased from 26.77 points at pretest to 34.32 points at posttest in the intervention group (P = .065) and from 28.27 points at pretest to 32.61 points at post-test in the control group (P = .255), showing no significant difference in the amount of change between the 2 groups (P = .065). Sleep quality was assessed based on 21 potential points. The mean score decreased from 10.75 points at pretest to 10.34 points at posttest in the intervention group (P = .138), whereas it increased from 10.10 points at pretest to 10.29 at posttest in the control group (P = .912). However, there was no significant difference in the amount of change between the 2 groups (P = .586; Table 3). Among physical activities, there were no significant differences between the 2 groups regarding work-related high- and moderate-intensity physical activities; walking or using a bicycle except for going to work; high-intensity sports, exercise, and leisure activities; time sitting or lying down; and duration of muscle strengthening exercise.

3.3. Effects of the PCP counseling program on mental health

Depression was assessed based on 27 potential points. The mean score decreased from 5.82 points at pretest to 4.82 points at posttest in the intervention group (P = .720) and from 6.17 points at pretest to 4.98 points at posttest in the control group (P = .871). There was a significant difference in the pretest-posttest change in the depression score between the 2 groups with a decrease of 1.00 points and 1.19 points in the intervention and control groups (P = .015), respectively. Anxiety

Table 2

Sociodemographic characteristics of the participants.

Variables	Exp (N = 44)	Cont (N = 41)	t or χ²	P
	Mean ± SD or N (%)			
Age	32.50 ± 4.29	30.83 ± 4.44	0.127	.723
Sex				
Male	5 (11.4)	8 (19.5)	1.088	.372
Female	39 (88.6)	33 (80.5)		
Marital status				
Single	30 (68.2)	30 (73.2)		
Married	12 (27.3)	8 (19.5)	1.346	.817α
Divorced	1 (2.3)	1 (2.4)	* Fisher's exact test	
Widowed	0 (0)	0 (0)		
Others	1 (2.3)	2 (4.9)		
Highest education level				
Middle school	0 (0)	0 (0)		
High school	3 (6.8)	3 (7.3)	2.938	.413α
College	2 (4.5)	3 (7.3)	* Fisher's exact test	
University	26 (59.1)	29 (70.7)		
Graduate school	13 (29.5)	6 (14.6)		
Employment status				
Regular	23 (52.3)	25 (61.0)	3.263	.365α
Non-regular	7 (15.9)	9 (22.0)	* Fisher's exact test	
Part time	7 (15.9)	5 (12.2)		
	7 (15.9)	2 (4.9)		
Height (cm)	162.02 ± 6.50	163.93 ± 7.57	2.183	.143
Weight (kg)	62.96 ± 16.53	60.19 ± 10.95	2.898	.092
BMI (kg/m²)	22.93 ± 5.93	22.35 ± 3.33		
<18.5	3 (6.8)	4 (9.7)		
18.5~24.9	31 (70.5)	33 (80.5)	2.712	.460α
25~29.9	6 (13.6)	2 (4.9)	* Fisher's exact test	
≥30	4 (9.0)	2 (4.9)		
Mean number of PCP counseling visits	14.2	5.8		

α Fisher exact test.
BMI = body mass index, Cont = control group, Exp = experimental group.

Table 3

Effects of PCP counseling program on lifestyle habits in the intervention and control groups.

Variables		Pretest	Post-test	(paired) t	P	Difference	(unpaired) t	P
		Mean ± SD				Mean ± SD		
Drinking	Exp	4.25 ± 4.24	3.40 ± 3.48	−1.767	.081	0.84 ± 2.64	2.760	.007**
	Cont	6.02 ± 5.00	5.41 ± 5.44	−2.036	.045*	0.61 ± 2.22		
Nutrition	Exp	26.77 ± 4.63	34.32 ± 7.31	−1.872	.065	7.54 ± 6.53	3.506	.065α
	Cont	28.27 ± 2.24	32.61 ± 6.34	1.146	.255	4.34 ± 6.89		
Sleep quality	Exp	10.75 ± 2.03	10.34 ± 2.15	1.499	.138	-0.41 ± 2.11	0.547	.586
	Cont	10.10 ± 1.97	10.29 ± 1.80	0.111	.912	0.19 ± 1.80		
BMI	Exp	22.93 ± 5.93	23.80 ± 5.68	1.500	.137	-0.13 ± 1.14	0.481	.632
	Cont	22.35 ± 3.33	22.39 ± 3.32	1.379	.172	0.04 ± 0.69		

α Welch test.
BMI = body mass index, Cont = control group, Exp = experimental group.
**P < .01, *P < .05

was assessed based on 63 potential points. The mean score decreased from 10.02 points at pretest to 7.16 points at posttest in the intervention group (P = .151) and from 9.76 points at pretest to 9.10 points at posttest in the control group (P = .227). There was a significant difference in the pretest-posttest change in the anxiety score between the 2 groups with a decrease of 2.86 points in the intervention group and that of 0.65 points in the control group (P = .011). Social network, which was indicative of social support, was assessed based on 50 potential points. Both groups showed moderate to high scores with a decrease from 33.30 points at pretest and 32.91 points at posttest in the intervention group (P = .371) and an increase from 32.34

points at pretest to 32.80 points at posttest in the control group (P = .927). However, there was no significant difference in the amount of change between the two groups (P = .967; Table 4).

3.4. Effects of the PCP counseling program on health promoting behavior

The mean health-promoting behavior score increased from 2.49 points at pretest to 2.60 points at posttest in the intervention group (P = .922) but decreased from 2.50 points at pretest to 2.48 points at posttest in the control group (P = .295).

Table 4

Primary care physician counseling program on mental health in intervention and control groups.

Variables		Pretest	Post-test	(paired)		Difference	(unpaired)	
		Mean ± SD		t	P	Mean ± SD	t	P
Depression	Exp	5.82 ± 3.61	4.82 ± 4.75	−0.360	.720	−1.00 ± 4.06	2.482	.015*
	Cont	6.17 ± 5.31	4.98 ± 4.07	−0.163	.871	−1.19 ± 4.11		
Anxiety	Exp	10.02 ± 8.74	7.16 ± 7.53	0.151	.880	−2.86 ± 6.71	2.605	.011*
	Cont	9.76 ± 7.39	9.10 ± 7.10	−1.218	.227	−0.65 ± 5.85		
Social network	Exp	33.30 ± 4.78	32.91 ± 4.82	0.900	.371	−0.38 ± 5.32	−0.042	.967
	Cont	32.34 ± 4.98	32.80 ± 5.63	0.092	.927	0.46 ± 5.12		

Welch test.

Cont = control group, Exp = experimental group.

**P < .01, *P < .05.

However, there was no significant difference in the amount of change between the 2 groups (P = .266). Regarding the subdomains of health-promoting behavior, the mean health responsibility score increased from 2.53 points at pretest to 2.65 points at posttest in the intervention group (P = .004) and from 2.18 points at pretest to 2.29 points at posttest in the control group (P = .008). There was a weak but significant difference in the pretest-posttest change in the health responsibility score between the 2 groups with an increase of 0.11 ± 0.61 points and 0.11 ± 0.39 points in the intervention and control groups (P = .04), respectively. The mean physical activity score increased from 2.20 points at pretest to 2.22 points at posttest in the intervention group (P = .348) and from 2.05 points at pretest to 2.17 points at post-test in the control group (P = .771). However, there was no significant difference in the amount of change between the 2 groups (P = .348). The mean nutrition score increased from 2.14 points at pretest to 2.27 points at posttest in the intervention group (P = .441) and from 2.07 points at pretest and 2.12 points at post-test in the control group (P = .191). However, there was no significant difference in the amount of change between the 2 groups (P = .052). The mean interpersonal relationship score increased from 2.78 points at pretest to 2.81 points at posttest in the intervention group (P = .916) but decreased from 2.77 points at pretest to 2.74 points at post-test in the control group (P = .617). However, there was no significant difference in the amount of change between the 2 groups (P = .938). The mean spiritual growth score increased from 2.47 points at pretest to 2.65 points at posttest in the intervention group (P = .725) but decreased from 2.52 points at pretest to 2.46 points at post-test in the control group (P = .171). However, there was no significant difference in the amount of change between the 2 groups (P = .295). The mean stress management score increased from 2.14 points at pretest to 2.28 points at posttest in the intervention group (P = .944) and from 2.13 points at pretest to 2.18 points at post-test in the control group (P = .379). However, there was no significant difference in the amount of change between the 2 groups (P = .074).

The mean health belief score decreased from 3.65 points at pretest to 3.58 points at posttest in the intervention group (P = .143) and decreased significantly from 3.44 points at pretest to 3.41 points at posttest in the control group (P = .046). However, there was no significant difference in the amount of change between the 2 groups (P = .506).

The mean self-efficacy score increased from 3.65 points at pretest to 3.84 points at posttest in the intervention group (P = .143) and from 3.44 points at pretest to 3.61 points at posttest in the control group (P = .132). There was a significant difference in the pretest-posttest change in the mean self-efficacy score between the 2 groups with an in-crease of 0.18 points and 0.16 points in the intervention and control groups (P = .001; Table 5), respectively.

3.5. Effects of the PCP counseling program on blood test and urinalysis results

The results showed significant differences in pretest-posttest change in hematocrit, red blood cell count, white blood cell count, and total iron-binding capacity between the 2 groups, although the values in both groups were within the normal range.

4. Discussion

The percentage of participants with regular and non-regular employment status was 52.3% and 15.9% in the intervention group, respectively, and 61.0% and 22.0% in the control group, respectively. The percentage of unemployed individuals was 15.9% and 4.9% in the intervention and control groups, respectively. According to Statistics Korea, the labor force participation rate in the economically active population, as of November 2019 before COVID-19, was 63.6% and 78.9% among individuals aged 20 to 29 and 30 to 39 years, respectively, indicating a high labor force participation rate in this study.[27]

When they were asked about their intention to quit smoking, all participants in the intervention group and 4 in the control group responded that they intend to quit smoking within 6 months or some other time. One participant intended to quit smoking within 1 month. The percentage of smokers was relatively low in this study due to the inclusion of more female participants. In 2019, the smoking rate in South Korea was 21.5%, of which 35.7% were males and 6.7% were females.[28] The smoking rate initially showed a decreasing trend after the implementation of smoking cessation counseling and medication assistance policies funded by taxes collected from the cigarette price hike in 2015 for reducing the smoking rate among South Korean males. However, the smoking rate in South Korea is increasing again. Smokers find it difficult to voluntarily quit smoking due to nicotine dependence, and hence, the success rate of smoking cessation through personal efforts tends to be low. Nicotine secretes dopamine and other neurotransmitters in the brain to reinforce dependence on cigarettes, and thus, smoking must be viewed as an addictive disease rather than just a habit. This change in perspective increases the success rate of smoking cessation through counseling and medication administered by healthcare professionals.[29]

For drinking status, there were no participants in the alcohol dependence group in both groups. The mean score decreased from 4.25 points at pretest to 3.40 points at posttest in the intervention group (P = .081) and the mean score decreased significantly from 6.02 points at pretest to 5.41 points at posttest in the control group (P = .045). Regarding pretest-posttest change, the intervention group showed a more significant decrease of 0.84 points, as compared to 0.61 points in the control group (P = .007). Therefore, it is believed that the regular consolation process in the PCP counseling program could help control drinking habits.

Table 5

Primary care physician counseling program on health-promoting behavior in intervention and control groups.

Variables		Pretest	Post-test	(paired)		Difference	(unpaired)	
		Mean ± SD		t	P	Mean ± SD	t	P
Health promoting behavior	Exp	2.49 ± 0.47	2.60 ± 0.60	−0.099	.922	0.11 ± 0.45	−1.120	.266
	Cont	2.50 ± 0.46	2.48 ± 0.45	1.055	.295	−0.02 ± 0.33		
Health responsibility	Exp	2.53 ± 0.57	2.65 ± 0.60	2.995**	.004**	0.11 ± 0.61	−2.084	.040*
	Cont	2.18 ± 0.52	2.29 ± 0.59	2.737	.008**	0.11 ± 0.39		
Physical activity	Exp	2.20 ± 0.85	2.22 ± 0.87	0.944	.348	0.02 ± 0.60	0.892	.348α
	Cont	2.05 ± 0.57	2.17 ± 0.61	0.202	.771	0.12 ± 0.55		
Nutrition	Exp	2.14 ± 0.50	2.27 ± 0.60	0.774	.441	0.12 ± 0.47	−1.969	.052
	Cont	2.07 ± 0.42	2.12 ± 0.44	1.319	.191	0.05 ± 0.35		
Interpersonal relationship	Exp	2.78 ± 0.61	2.81 ± 0.70	0.106	.916	0.03 ± 0.55	−0.078	.938
	Cont	2.77 ± 0.54	2.74 ± 0.53	0.502	.617	−0.02 ± 0.35		
Spiritual growth	Exp	2.47 ± 0.64	2.65 ± 0.71	−0.353	.725	0.17 ± 0.55	−1.053	.295
	Cont	2.52 ± 0.60	2.46 ± 0.54	1.382	.171	−0.06 ± 0.44		
Stress management	Exp	2.14 ± 0.55	2.28 ± 0.59	0.070	.944	0.13 ± 0.54	−1.808	.074
	Cont	2.13 ± 0.47	2.18 ± 0.48	0.885	.379	0.04 ± 0.38		
Health belief	Exp	3.65 ± 0.66	3.58 ± 0.40	1.480	.143	−0.00 ± 0.35	0.667	.506
	Cont	3.44 ± 0.65	3.41 ± 0.32	2.025	.046*	−0.03 ± 0.29		
Self-efficacy	Exp	3.65 ± 0.66	3.84 ± 0.75	1.480	.143	0.18 ± 0.49	−3.32	.001**
	Cont	3.44 ± 0.65	3.61 ± 0.66	1.520	.132	0.16 ± 0.50		

α Welch test.

Cont = control group, Exp = experimental group.

**P < .01, *P < .05.

For nutritional status, as there was no significant difference observed in the amount of change between the 2 groups (P = .065), the effect of the program could not be determined. Nonetheless, scores of ≥ 39, 28–38, and ≤ 27 points show "a generally good dietary habit," "average dietary habit for South Koreans," and "poor dietary habit," respectively. The findings showed that both the intervention and control groups had scores that were not good. Specifically, a pretest score of 26.77 points in the intervention group indicated poor dietary habit and a pretest score of 28.27 points in the control group indicated below average dietary habit, which confirmed that the participants did not have good dietary habits.

The findings showed that regular meetings with a PCP for health-related counseling could help reduce anxiety levels.

Regarding health-promoting behaviors, there was a significant difference in the pretest-posttest change in the health responsibility score between the 2 groups with an increase of 0.11 ± 0.61 points in the intervention group and 0.11 ± 0.39 points in the control group (P = .04). The health belief was based on the fact there was no significant difference in the amount of change between the 2 groups (P = .506). The mean self-efficacy score increased by 0.18 points in the intervention group and 0.16 points in the control group. This means that there was a significant difference between the 2 groups (P = .001). The findings confirmed that the PCP counseling program could help increase self-efficacy for good health management. The findings showed significant differences in pretest-posttest change in hematocrit, red blood cell count, white blood cell count, and total iron-binding capacity, although the values in both groups were within the normal range. All subjects who participated in the experiment had no abnormal findings before the experiment.

To maintain health, it is crucial to increase motivation and strengthen the capacity for continuous health promotion efforts, which includes practicing a healthy lifestyle. According to the education and consultative guidelines, there was an increase in contact time between the patient and the doctor who provides services. As a result, emotional support increased due to the close relationship established. In a study by Bong Seung-won et al,[30] 77.0% of respondents stated that a primary care system is necessary. The most important roles and responsibilities of the PCP were identified as medical examinations for early detection of cancer or chronic diseases, vaccination, and the management of stress and chronic diseases. Consultative time may also have an impact on primary healthcare. A study comparing counseling time showed that during the 8.25-minute counseling session for the experimental group, the counseling record on blood pressure, smoking, drinking alcohol, and vaccination had a higher frequency than the 7.04-minute counseling session for the control group. It was also reported that the proportion of counseling in which one or more health education items were recorded increased by an average of 6% or more.[31] In addition, a literature study on consultation time with PCPs from 1946 to 2016 found that 18 countries, representing about 50% of the world's population, spent less than 5 minutes with their PCPs. It has been confirmed that there is a significant association between hospitalization and primary health care due to PCP density, physician effectiveness, and physician satisfaction.[32] Regarding the contents of counseling, the perception, priorities, and content varied between the attending physician and the patient. The content for the attending physician was based on working conditions and medical service experience and prioritized intervention direction, behavioral goal setting, and outcome evaluation. In terms of the patients, the focus of the content was on lifestyle-related habits, health concepts, individual roles, and requirements.[33] Furthermore, in a study on patients who participated in primary medical counseling in Sweden, the most common counseling content was related to exercise. Moreover, exercise and diet were identified as factors that promoted continued counseling.[34] In addition, participants in this study received specific and detailed advice related to exercise and diet and to incorporate it into their lifestyle habits.

In summary, the findings showed that the continuous PCP counseling program applied to the youth population could help reduce drinking-related lifestyle habits and anxiety and improve self-efficacy. The national health insurance system in South Korea has contributed significantly to reducing inequity in healthcare utilization for primary care. However, inequity in healthcare utilization between social groups remains a major problem for areas other than disease treatment, such as health promotion and disease prevention. Patients must be able to receive continuous medical services and care services from the same healthcare professional, and patient medical information must be systematically accumulated. However, it is difficult to maintain continuity within a system plagued with consumptive healthcare utilization

behavior, patients frequently changing healthcare institutions and getting reexamined or retested for the same disease upon visiting different healthcare institutions. The PCP system can serve as a facilitator that provides counseling and continues to monitor health status from a nearby location. The youth population needs to develop an interest in health promotion and continue to practice health-promoting behaviors. For this, regular health checkups, healthy behavior practice training, and psychological counseling through a trusted PCP could be helpful.

5. Conclusions

This study aimed to identify the impact of implementing a 6-month PCP counseling program for youths with healthcare needs. Moreover, it also aimed to use the PCP counseling program to establish health-promoting management practices for the youth population.

The findings showed that the PCP counseling program was effective in improving drinking and alcohol use control behaviors, reducing anxiety, improving health responsibility, and increasing self-efficacy. Maintaining a healthy lifestyle is pertinent for disease prevention among the youth population. Therefore, the continued implementation of healthcare programs using physicians who are familiar and close to individuals' homes can help youth live a healthy life. Moreover, the study shows the need for health-related programs and policies to motivate and enable the youth population to participate in health promotion meetings that foster healthy social relationships to aid mutual support and positively influence lives.

Author contributions

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Methodology: Shin-Ae Kim.
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