Research Paper
Impact of Self-care Education on Self-efficacy and Quality of Life of Late Adolescents With Congenital Heart Disease

Parisa Hasannezhad[1] , Sedigheh Khanjari[2] , Akbar Nikpajouh[3] , Zahra Hasannezhad[4], Hamid Haghani[2] , Fahimeh Sabeti[2*]

1. Department of Pediatric Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
2. Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
3. Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran.
4. Social Research Center, Karaj Municipality, Karaj, Iran.

Citation Hasannezhad, P., Khanjari, S., Nikpajouh, A., Hasannezhad, Z., Haghani, H., & Sabeti, F., 2023. Impact of Self-care Education on Self-efficacy and Quality of Life of Late Adolescents With Congenital Heart Disease. *Journal of Client-Centered Nursing Care*, 9(1), pp. 69-78. https://doi.org/10.32598/JCCNC.9.1.480.1

doi **https://doi.org/10.32598/JCCNC.9.1.480.1**

ABSTRACT

Background: Self-care of adolescents with congenital heart disease (CHD) is one of the challenges of the health care system. CHD is a common chronic disease that affects the quality of life (QoL) and self-efficacy of adolescents. This study compares the effectiveness of self-care education by face-to-face method and video clip (VC) on self-efficacy and QoL in late adolescents with CHD.

Methods: This research was a non-randomized clinical trial. A total of 111 late adolescents aged 18 to 21 years with CHD referred to Rajaie Cardiovascular, Medical, and Research Center in Tehran, Iran, were recruited by convenience sampling and non-randomly assigned to either control, face-to-face (F2F), or VC groups (37 subjects in each group). The F2F group participated in two educational sessions (each lasted 35-45 minutes) with an interval of one week, and the VC group received a 90-minute video to watch at home. The study data were collected before (T1) and two months after the intervention (T2), using the Generalized Self-Efficacy (GSE) scale and World Health Organization's Quality of Life Questionnaire (WHOQOL-BREF) and analyzed in SPSS version 19 software using the Chi-square test, Fisher test, paired t test, Scheffé test, and ANOVA. The significance level was set at $P < 0.05$.

Results: Before the intervention, demographic variables, self-efficacy, and QoL were not significantly different in the three groups. The self-efficacy significantly increased in the F2F ($P < 0.004$) and VC groups ($P < 0.031$) at T2. Furthermore, QoL dimensions significantly improved in the F2F and VC groups ($P < 0.05$), except for the environment dimension ($P > 0.05$).

Conclusion: Self-care education through F2F and VC significantly affects the self-efficacy and QoL of late adolescents. Such educational programs can greatly reduce the possible complications of the disease by empowering this group.

* Corresponding Author:
Fahimeh Sabeti, PhD.
Address: Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
Tel: +98 (916)6181998
E-mail: sabetifa@yahoo.com

Highlights

• Chronic health conditions such as congenital heart disease affect adolescents' quality of life (QoL) and their perception of self-efficacy.

• Self-care education is important in increasing knowledge and creating behavioral changes in adolescents.

• Self-care education significantly increased self-efficacy in the face-to-face and VC groups.

• The QoL dimensions improved in the face-to-face and VC groups except for the environment dimension.

Plain Language Summary

Congenital heart disease is one of the most common heart defects that affect the self-efficacy and QoL of adolescents. Our results showed that self-care education by both face-to-face method and VCs could improve the self-efficacy and QoL in late adolescents with congenital heart disease.

1. Introduction

Congenital heart disease (CHD) is one of the most common heart defects with varying degrees and severities (Parker et al., 2020). It is defined as structural abnormalities of the heart, aorta, or other large blood vessels present at birth. Out of 35 known congenital heart defects, the most common is the ventricular septal defect (Hockenberry and Wilson, 2018). According to a systematic review, CHD prevalence is around 9.1 per 1000 births (Van Der Linde et al., 2011). A global study from 1970 to 2017 concludes that the maximum prevalence of CHD was reported between 2010 and 2017 (7 years) at 9.410 per 1000, indicating a significant CHD increase compared to the previous 15 years (Liu, Y., et al., 2019). The prevalence of CHD in the Iranian population was estimated at 12.30 per 1000 live births in Ahvaz City (Rahim et al., 2008) and 8.6 per 1000 live births in Gorgan City (Nikyar et al., 2011). According to a study, the frequency of diagnosis of CHD varies from ventricular septal defect (39.3%) with the highest frequency to aortic stenosis (5.1%) with the lowest frequency (Ahmadi et al., 2020). However, the survival rate of these patients has increased due to advances in diagnostic methods, surgery, and post-operative care. Now more than 90% of these children reach adolescence and adulthood (Huisenga et al., 2020).

Adolescence is a vulnerable and critical period in the life of people with chronic diseases such as CHD. This period is when the teenager passes from childhood to adulthood and takes responsibility for life management, health, and self-care (Sable et al., 2011). Adolescents can manage CHD when they acquire disease-specific knowledge, receive education, and participate in educational programs related to self-care management and the transition process (Burström et al., 2017). Therefore, health education programs are needed to empower these adolescents to manage the challenges of the transition to adulthood. Education during this transition period empowers adolescents to take care of themselves and improve their health status and prevent possible complications in the future (Ladouceur et al., 2017).

Chronic health conditions such as CHD in adolescents affect their perception of quality of life (QoL) and self-efficacy (Demet et al., 2017). Self-efficacy is a psychosocial factor that is very important in interventions related to the well-being and health status of patients (Thomet et al., 2018). Self-efficacy is central to the Bandura's social cognitive theory and is defined as "Beliefs in one's capabilities to mobilize the motivation, cognitive responses, and courses of action needed to meet given situation demands"(Bandura, 1997). Self-efficacy was initially conceptualized as beliefs in specific situations. Sherer et al. (1982) expanded on this concept and developed the term Generalized Self-efficacy (GSE), which is defined as an individual's perception of their abilities to perform in different situations (Sherer et al., 1982; Imam, 2007). One of the relatively new factors that have predictive value for well-being and QoL in CHD is GSE (Thomet et al., 2018; Moons and Luyckx, 2019). It has been found that self-efficacy can increase QoL in adolescents (Haraldstad et al., 2019).

Studies on self-efficacy and QoL in adolescents with CHD show contradictory results. QoL in these adolescents is reported to be low in some studies (So et al., 2019; Liu et al., 2022; Demet et al. al., 2017). Mean-

while, another study shows that most children and adolescents with CHD have a high QoL (Amodeo et al., 2022). Also, the results of some studies show that children's self-efficacy is not much affected by their CHD (Moschovi et al., 2020; Demet et al., 2017), but other studies showed that self-efficacy is weak in adolescents with some chronic conditions (Cramm et al., 2013; Survonen et al., 2019).

Health education is widely practiced to prevent the possible complication of chronic disease and improve knowledge and behavioral changes in adolescents, but its effectiveness is still questioned (Yoon et al., 2021). Each educational method for health education has advantages, benefits, and degrees of effectiveness depending on the type of audience and its specific field (Saha et al., 2005). The most popular teaching methods are direct (such as face-to-face [F2F], lectures, and group discussions) and indirect methods (such as electronic, audio, and visual training using mobile phones, CDs, and computers) (Saif, 2013). Educational video clip (VC) can create, store, and save information and is easy to use and cost-effective, but one of the most important disadvantages is their virtual nature and lack of active communication and a lively instructor (Johnson and Mighten, 2005). According to a study, using VC was associated with improved patient understanding of treatment and increased satisfaction but did not improve QoL (Fernandes et al., 2020). Another study shows that self-care education through F2F and VC methods improves the QoL of hemodialysis patients (Hemmati Maslakpak & Shams, 2015). Also, a study shows that F2F education improves self-care behaviors in patients with type 2 diabetes (Ildarabadi et al., 2019). Meanwhile, the results of another study show that video education in patients with diabetes is better than F2F in some areas (Hemmati Maslakpak et al., 2017). Considering the different degrees of effectiveness of educational methods and the importance of self-care education in adolescents with CHD, we compared the effectiveness of self-care education with two educational methods, i.e., F2F and VC education on self-efficacy and QoL in the late adolescents with CHD.

2. Materials and Methods

Design, setting, and sample

This research was a non-randomized clinical trial with a pretest-posttest design. The study sample included 111 late adolescents aged 18-21 years with CHD referring to Rajaie Cardiovascular, Medical, and Research Center in Tehran, Iran, from June to September 2018. The subjects were non-randomly assigned into three groups,

including two intervention groups of F2F and VC and one control group (n=37 in each group). To prevent data contamination, the control group, the VC group, and the F2F group were recruited continuously in the first, second, and third week, respectively, according to inclusion criteria until the sample size was achieved. It is worth mentioning that at first, 120 participants were assessed for eligibility. Some participants (n=7) did not meet the inclusion criteria, and some (n=2) refused to participate in the study (Figure 1). The sample size was determined based on a 95% confidence level, test power of 80%, d=5, standard deviations of 14.4 and 15.2 for the QoL in intervention and control groups in a previous study (Edraki et al., 2014) and a dropout rate of 10%. The inclusion criteria were as follows: being literate, not having a history of hearing, vision, and mental disorders and other chronic diseases, according to their expression, not participating in similar studies during the past year, having a clinical record in the CHD clinic, and having a DVD player at home (in VC group). The exclusion criteria were as follows: experiencing stressful events during the research or two months after the end of the educational program, such as divorce, financial crisis, or death of a family member, and not participating in all educational sessions. All adolescents voluntarily participated in the study and signed the written informed consent before the study.

Study instruments

The study data were collected by three questionnaires: demographic information questionnaire including age, sex, marital status, family history of CHD, education level, and history of heart surgery; Generalized Self-efficacy (GSE) scale; and World Health Organization's Quality of Life Questionnaire (WHOQOL-BREF).

The GSE scale (Sherer et al., 1982) consists of 17 items scored on a 5-point Likert scale (from 1= strongly disagree to 5= strongly agree). In this scale, questions 2, 4, 5, 6, 7, 10, 11, 12, 14, 16, and 17 are inversely scored. Therefore, the maximum score that a person can get is 85, and the minimum is 17, where a higher score indicates stronger self-efficacy. In the study by Sherer et al., the construct validity and criterion validity of the GSE scale was confirmed, and the Cronbach alpha reliability coefficient was 0.86 (Sherer et al., 1982). Edraki et al. (2014) confirmed the reliability of the Persian version of this scale (Cronbach alpha=0.76) (Edraki et al., 2014). Also, the Cronbach alpha coefficient was calculated as 0.73 in our study, which confirms the internal consistency of the questionnaire.
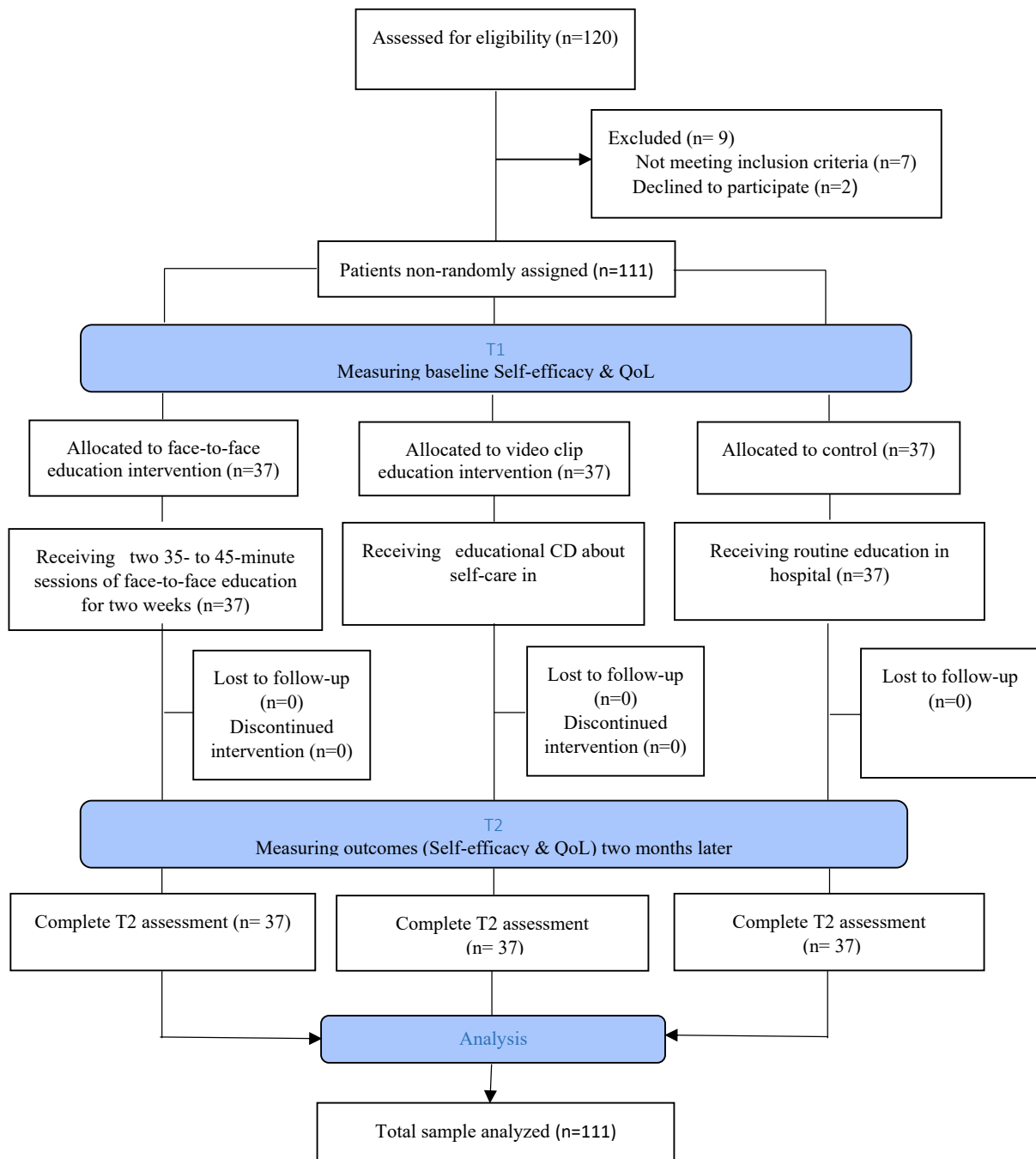
Figure 1. CONSORT flowchart of the study process

The WHOQOL-BREF is a 26-item abbreviated generic QoL Scale developed by the World Health Organization. It consists of four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and the environment (8 items). Two items are examined separately: item 1 asks about an individual's overall perception of QoL, and item 2 asks about an individual's overall perception of their health. The four domain scores denote an individual's perception of QoL in each particular domain. The items are scored on a 5-point Likert scale in a positive direction. Questions 3, 4, and 26 are scored in reverse. Raw scores on the four domains were transformed to a 4–20 score and then changed linearly to a 0–100 scale, where 100 is the highest and 0 is the least QoL. Higher scores indicate higher QoL (Silva et al., 2011; WHO, 1996). The Persian version of this questionnaire has appropriate cultural adaptation, and its reliability and validity have been confirmed. The Cronbach alpha and intra-class correlation in all domains were above 0.7, except for the dimension

of social relations, which was 0.55. Also, 83% (20/24) of the WHOQOL-BREF questions showed maximum correlation with their original domains (Nedjat et al., 2008). Before the intervention, all questionnaires were completed by the intervention and control groups. Two months after the intervention, when the patients came for a regular periodic visit with the coordination of the clinic manager, the GSE scale and the WHOQOL-BREF questionnaire were completed again by the three groups.

Educational intervention

All three groups received routine education, and the intervention groups received self-care education through the F2F method and VC in addition to routine education.

The educational content was prepared in 5 domains: definition and description of heart defects, therapeutic management/care, prevention of complications, diet and physical activities, reproductive health/ pregnancy, and genetic counseling, which was the same for both groups.

The educational content was approved by five experts: two cardiologists and three faculty members of the Nursing and Midwifery School, Iran University of Medical Sciences (IUMS). The educational content is described in detail in Table 1. Self-care education in the F2F method was provided individually to each of the adolescents during two sessions of 35 to 45 minutes, based on the needs of the adolescent and the type of CHD, by a researcher who was a clinical nurse of the same hospital. The training was conducted in a quiet room in the clinic for one week. At the end of each session, the participants' questions were fully answered. Also, five minutes of the next session were allocated to review the topics of the previous session. In VC education, a compact disc (CD) containing a 90-minute self-care instructional video was provided to adolescents to watch at home. This VC included pictures, videos, slides, and lectures similar to the content of the F2F method, which was designed under the supervision of the project's expert consultant (cardiologist), and its content was approved by three faculty

Table 1. Summary of the intervention content

Type of Education	Objectives	Implementation	Time (min)
Face to Face (F2F)	Session I Description of the goals of the study Getting to know the adolescent Assessing the educational needs Motivating and encouraging adolescent to participate in education Determining the patient's learning style Implementing self-care plan Session II Continue of implementing self-care plan	Getting to know and analyze learners' knowledge about the concept of the disease. Adolescent's activation: (1) Assessing patient health literacy, (2) Activating them in education, (3) Offering educational contents in patient preferred formats Educational content in 5 domains: 1) definition and description of heart defects, 2) therapeutic management/care, 3) prevention of complications, 4) diet and physical activities 5) Reproductive health/ pregnancy plan/ genetic counseling which was individually adjusted for nine common CHDs according to the needs of each adolescent, including atrial septal defect (ASD), ventricular septal defect (VSD), coarctation of the aorta (COA), tetralogy of Fallot (TOF), transposition of the great arteries (TGA), patent ductus arteriosus (PDA), aortic stenosis (AS), pulmonary stenosis (PS), and Ebstein anomaly. F2F education and answering questions Reviewing the previous session and answering the questions Self-Care Plan Cultivate a positive attitude toward the illness, self-assessment and self-control abilities. F2F education and answering questions Summary and conclusion	35-45
VC	Description about goals of the study Getting to be familiarized with adolescent Encourage to watch educational CD Offering educational contents to patient by compact disc (CD) Implementing self-care plan	Introduction about how to use the content of CD Educational CD content included in 5 dimensions (described in F2F section) for nine common CHDs: ASD, VSD, COA, TOF, TGA, PDA, AS, PS, and Ebstein anomaly. The educational content included pictures, videos, slides, and lectures.	90
Phone call follow-up/week 1	F2F & VC	Overview of trained topics Answering the questions	15-20
Phone call follow-up/week 2	F2F & VC	Overview of trained topics Answering the questions	15-20

QoL: Quality Of Life; Cd: Compact disc; VC: video clip; T1: before the intervention; T2: two months after the intervention.

members and two cardiologists. During the intervention period, the researcher contacted the adolescents by telephone to ensure they had watched the CD. After the end of the intervention, the researcher followed up with the teenagers by phone for two weeks to remind them of the training and answer the questions.

Data analysis

To compare demographic variables between three groups, the Chi-square test, Fisher exact test, and 1-way ANOVA were used. The changes in self-efficacy and QoL after the intervention were assessed via paired t test in the control and experimental groups (intergroup). The difference in outcomes at the end of the study was compared by 1-way ANOVA. After running ANOVA and obtaining a significant F statistic (i.e., rejecting the null hypothesis that the means are equal), the Scheffé test was run to determine which pairs of means were significant. The data were analyzed in SPSS software, version 19. The significance level was set at 0.05.

3. Results

Data from 111 late adolescents with CHD were analyzed. Demographic information of the samples is presented in Table 2. There was no significant difference between the three groups regarding age, sex, marital status, family history of CHD, education level, and history of heart surgery. According to Table 3, there

was no significant difference between the mean self-efficacy scores in the three groups before the intervention (P =0.584). After the intervention, there was a significant difference between the mean self-efficacy scores in the three groups (P=0.001). The paired t test results showed a significant difference between the mean self-efficacy scores before and after the intervention in the F2F and VC groups (P<0.05). Also, the results of 1-way ANOVA showed a significant difference between the mean self-efficacy scores in the three groups after the intervention (P<0.05).

Regarding the QoL, no significant difference was found at baseline between the three groups (P=0.299). After the intervention, according to 1-way ANOVA, there was a significant difference in the mean score of QoL in all subscales except in the environment dimension in three groups (P=0.663). Also, the paired t test showed a significant difference between the mean scores of QoL before and after the intervention in F2F and VC groups in all dimensions except for the environment (P=0.32).

4. Discussion

The results showed that our educational program significantly improved self-efficacy and QoL in late adolescents with CHD in F2F and VC methods. Both methods equally increased the self-efficacy and QoL, and there was no significant difference between the self-efficacy and QoL scores in F2F and VC groups after the intervention. The study of

Table 2. Demographic characteristics of the adolescents with congenital heart disease in the three groups

Variables	Groups	No. (%)			Sig.
		Video Clip	Face-to-Face	Control	
Gender	Male	22(59.5)	18(48.6)	20(54.1)	χ^2=0.871
	Female	15(40.5)	19(51.4)	17(45.9)	P=0.647*
Age, y	18-19	8(21.7)	9(24.3)	8)21.6)	F=0.836
	19-20	5(13.5)	11(29.7)	6(16.2)	P=0.436**
	20-21	24(64.8)	17(46.0)	23(62.2)	
Marital status	Single	29(78.4)	25(67.6)	28(75.7)	
	Married	8(21.6)	11(29.7)	9(24.3)	P=0.678***
	Divorced/Widowed	0(0)	1(2.7)	0(0)	
Family history of CHD	Yes	15(40.5)	14(37.8)	18(48.6)	χ^2= 0.959
	No	22(59.5)	23(62.2)	19(51.4)	P=0.619*
Education level	Elementary school	2(5.4)	4(10.8)	5(13.5)	
	High school	2(5.4)	4(10.8)	3(8.2)	P=0.187***
	Diploma	26(70.3)	18(48.6)	14(37.8)	
	University	7(18.9)	11(29.8)	15(40.5)	
History of heart surgery	Yes	21(56.8)	27(73.0)	22(59.5)	χ^2=2.398
	No	16(43.2)	10(27.0)	15(40.5)	P*=0.302

* The Chi-square test; **ANOVA; *** The Fisher exact test.

Client- Centered Nursing Care

Table 3. Mean±SD scores of QoL and self-efficacy in the adolescents with congenital heart disease in the control (n=37), face-to-face (n=37), and VC (n=37) groups at baseline (T1) and 2-month after the intervention (T2)

| Variables | Time | Mean±SD | | | P** | P*** |
		Control	F2F	VC		
Self-efficacy	T1	59.81±7.67	58.78±8.9	57.76±8.86	0.584	-
	T2	57.62±8.39	65.62±7.57	63.11±10.32	0.001	C vs F2F: 0.001 C vs VC: 0.032 F2F vs VC: 0.476
	P*	0.173	0.004	0.031	-	-
	Changes	-2.19±9.577	6.84±13.50	5.35±14.46	0.006	C vs F2F: 0.011 C vs VC :0.042 F2F vs VC :0.881
QoL	**Physical health** T1	60.95±10.61	56.95±19.23	55.92±12.61	0.299	-
	T2	57.35 15.81±	69.11±18.47	65.14±15.90	0.011	C vs F2F: 0.013 C vs VC :0.141 F2F vs VC: 0.597
	P*	0.210	0.012	0.017	-	-
	Changes	-3.59±17.15	12.16±28.02	9.22±22.45	0.009	C vs F2F: 0.015 C vs VC: 0.061 F2F vs VC: 0.859
	Mental health T1	57.43±18.01	55.51±19.77	58.00±9.41	0.792	-
	T2	56.14±19.72	67.30±16.39	66.08±15.11	0.011	C vs F2F: 0.023 C vs VC: 0.049 F2F vs VC: 0.955
	P*	0.745	0.020	0.016		-
	Changes	-1.30±24.03	11.78±29.34	8.08±19.39	0.066	-
	Social relationship T1	33.49±12.76	30.78±15.20	33.27±15.62	0.676	-
	T2	33.11±13.5	43.30±16.00	43.19±15.74	0.005	C vs F2F: 0.018 C vs VC: 0.019 F2F vs VC: 1.0
	P*	0.897	0.006	0.014		-
	Changes	-0.38±17.66	12.51±25.88	9.92±23.26	0.037	C vs F2F: 0.052 C vs VC: 0.150 F2Fvs VC: 0.859
	Environment T1	60.95±15.48	53.57±17.84	59.68±15.83	0.123	-
	T2	60.97±14.61	63.76±12.64	63.30±15.00	0.663	-
	P	0.994	0.014	0.32		-
	Changes	0.03±21.34	10.19±24.10	3.62±21.69	0.146	-

*The Paired t-test; **One-way ANOVA; ***Scheffé test.

Mohebbi et al. shows that the media-based cardiac rehabilitation training program has more impact on the self-efficacy of heart surgery patients than the F2F method (Mohebbi et al., 2018). The greater effect of media-based training may be due to conducting the first training session in this group through the use of computers in the hospital because the patients might be more sensitive to rehabilitation training at this point. A study shows that self-care education in adolescents with type 1 diabetes mellitus through mobile-based social networks improves their self-efficacy (Biglar Chopoghlo et al., 2021). Another study shows that F2F education is an effective method for increasing self-efficacy in patients with chronic diseases and thus improves their health status (Omidi et al., 2015). Self-efficacy refers to individual's thoughts about someone's abilities, capabilities, achievements, and failures and perception of the received feedback. Self-efficacy is highly related to self-belief (Luszczynska and Schwarzer, 2015; Haraldstad et al., 2019). It seems that health edu-

cation has increased adolescents' perception of their health status and improved their health beliefs and attitudes, and as a result, it has led to an increase in self-efficacy. Also similar to our study, the results of another study show that self-care education through F2F and VC programs improves the QoL of patients under hemodialysis (Hemmati Maslakpak and Shams, 2015). The results of other studies also show that educational programs with different methods positively impact the QoL in patients with chronic diseases (Khanjari et al., 2018; Lakdizaji et al., 2013; Mohaddes Ardebili et al., 2019). In this regard, previous studies showed that increasing self-efficacy as an influencing factor improves health-related QoL in adolescents (Thomet et al., 2018; Haraldstad et al., 2019; Demet et al., 2017). However, a study showed that video education improved patients' understanding of treatment and its side effects and increased patient satisfaction but did not improve their QoL (Fernandes et al., 2020). The difference between the results of this study and the current study can be due to the age of their participants (average age of 59.1 years) and the type of their disease in the two studies. The results of this study showed that self-care education had improved the QoL in all dimensions except for the environment dimension, which can be related to problems related to environmental indicators such as financial ability, available facilities, and access to health care services and community support systems such as non-governmental organizations (NGOs). Adolescence, as a sensitive and vulnerable period, is the transition stage from childhood to adulthood, especially late adolescence, when the adolescent must prepare for adulthood. Therefore, social and environmental support is very important in adolescent with chronic conditions such as CHD, when they have to accept social roles and participate in social activities. Hence, it seems that an educational program alone cannot increase the QoL in the environment dimension in adolescents with CHD. Also, the findings showed that despite no live and active educator in the VC education, the adolescents' self-efficacy and QoL improved. Maybe the reason is that the most audience of educational VC are children, adolescents, and young people. They are more familiar with digital technologies and therefore prefer virtual and video education over other methods.

Every research has some limitations. The first limitation of our study was overlooking the interests and recommendations of adolescents in preparing the educational clip due to the lack of time. Also, our study was conducted in a medical center, and to prevent information sharing between the intervention and control groups, randomization was not possible.

5. Conclusion

Self-care education in both F2F and VC methods improved self-efficacy and QoL in late adolescents with CHD, and there was no significant difference between the effects of the two educational methods. Health and self-care education are essential for adolescents with chronic diseases such as CHD. Since adolescents are more interested in digital technologies and virtual or video-based learning, it is suggested that healthcare providers, along with F2F education, benefit from these methods. It is also recommended to investigate the long-term effects of these educational methods and investigate the effectiveness of these methods in the form of a randomized study.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Iran University of Medical Sciences (Code: IR.IUMS.FMD.REC.1396.9311687003) and registered in the Iranian Registry of Clinical Trials (IRCT) (Code: IRCT20180417039341N1). All participants signed the written informed consent before the study.

Conflict of interest

The authors declared no conflict of interest.

References

Ahmadi, A. R., et al., 2020. Early results of the Persian Registry of Cardiovascular Disease/Congenital Heart Disease (PROVE/CHD) in Isfahan. *The Journal of Tehran University Heart Center,* 15(4), pp. 158–64. [DOI:10.18502/jthc.v15i4.5941] [PMID] [PMCID]

Amodeo, G., et al., 2022. Health-related quality of life in Italian children and adolescents with congenital heart diseases. *BMC Cardiovascular Disorders,* 22(1), pp. 173. [DOI:10.1186/s12872-022-02611-y] [PMID] [PMCID]

Bandura, A., 1997. Self-efficacy: The exercise of control, New York, W.H. Freeman and Company

Biglar Chopoghlo, S., et al., 2021. The self-efficacy improvement in adolescent girls with type 1 diabetes mellitus with self-care education through mobile-based social networking. *International Journal of Diabetes in Developing Countries,* 41, pp. 676-82. [DOI:10.1007/s13410-021-00929-5]

Burström, Å., et al., 2017. Adolescents with congenital heart disease: Their opinions about the preparation for transfer to adult care. *European Journal of Pediatrics,* 176(7), pp. 881-9. [DOI:10.1007/s00431-017-2917-9] [PMID] [PMCID]

Cramm, J. M., et al., 2013. The importance of general self-efficacy for the quality of life of adolescents with chronic conditions. *Social Indicators Research,* 113(1), pp. 551–61. [DOI:10.1007/s11205-012-0110-0] [PMID] [PMCID]

Demet, T., et al., 2017. Quality of life and self-efficacy of adolescents with chronic health conditions. *Dicle Tıp Dergisi,* 44, pp. 257-65. [DOI:10.5798/dicletip.339004]

Edraki, M., et al., 2014. The effect of educational program on the quality of life and self-efficacy of the mothers of the infants with congenital heart disease: A randomized controlled trial. *International Journal of Community based Nursing and Midwifery,* 2(1), pp. 51–9. [PMID]

Fernandes, D. T., et al., 2020. The impact of an educational video about radiotherapy and its toxicities in head and neck cancer patients. Evaluation of patients' understanding, anxiety, depression, and quality of life. *Oral Oncology,* 106, pp. 104712. [PMID]

Haraldstad, K., et al., 2019. Associations between self-efficacy, bullying and health-related quality of life in a school sample of adolescents: A cross-sectional study. *BMC Public Health,* 19(1), pp. 757. [DOI:10.1186/s12889-019-7115-4] [PMID] [PMCID]

Hemmati Maslakpak, M., Razmara, S. & Niazkhani, Z., 2017. Effects of face-to-face and telephone-based family-oriented education on self-care behavior and patient outcomes in type 2 diabetes: A randomized controlled trial. *Journal of Diabetes Research,* 2017, pp. 8404328. [PMID] [PMCID]

Hemmati Maslakpak, M. & Shams, S., 2015. A comparison of face to face and video-based self care education on quality of life of hemodialysis patients. *International Journal of Community based Nursing and Midwifery,* 3(3), pp. 234-43. [PMID]

Hockenberry, M. J. & Wilson, D., 2018. *Wong's nursing care of infants and children-E-book.* Amsterdam: Elsevier Health Sciences. [Link]

Huisenga, D., et al., 2020. Developmental outcomes after early surgery for complex congenital heart disease: A systematic review and meta-analysis. *Developmental Medicine & Child Neurology,* 63(1), pp. 29–46. [PMID] [PMCID]

Ildarabadi, E. H., Tabei, M. G. & Khosh, A. M., 2019. Effects of face-to-face and online training on self-care of middle-aged and elderly people with type 2 diabetes: A comparative study. *Open Access Macedonian Journal of Medical Sciences,* 7(7), pp. 1214–9. [PMID] [PMCID]

Imam, S. S., 2007. Sherer et al. general self-efficacy scale: Dimensionality, internal consistency, and temporal stability. Paper presented at: Proceedings of The Redesigning Pedagogy: Culture, Knowledge and Understanding Conference, Singapore, Mat 2007. [Link]

Johnson, J. P. & Mighten, A., 2005. A comparison of teaching strategies: lecture notes combined with structured group discussion versus lecture only. *The Journal of Nursing Education,* 44(7), pp. 319–22. [DOI:10.3928/01484834-20050701-06] [PMID]

Khanjari, S., Jahanian, S. & Haghani, H., 2018. The effect of blended training on the quality of life of children with nephrotic syndrome. *Journal of Family Medicine and Primary Care,* 7(5), pp. 921–6. [PMID] [PMCID]

Ladouceur, M., et al., 2017. Educational needs of adolescents with congenital heart disease: Impact of a transition intervention programme. *Archives of Cardiovascular Diseases,* 110(5), pp. 317–24. [PMID]

Lakdizaji, S., et al,. 2013. Effect of educational program on quality of life of patients with heart failure: a randomized clinical trial. *Journal of Caring Sciences,* 2(1), pp. 11–8. [PMID]

Liu, H. C., et al., 2022. Factors affecting psychological and health-related quality-of-life status in children and adolescents with congenital heart diseases. *Children,* 9(4), pp. 578. [DOI:10.3390/children9040578] [PMID] [PMCID]

Liu, Y., et al., 2019. Global birth prevalence of congenital heart defects 1970-2017: Updated systematic review and meta-analysis of 260 studies. *International Journal of Epidemiology,* 48(2), pp. 455-63. [PMID]

Luszczynska, A. & Schwarzer, R., 2015. Social cognitive theory. In: M. Conner, & P. Norman (eds.), Predicting Health Behaviour (2nd ed., pp. 127-169). Buckingham, UK: Open University Press. [Link]

Mohaddes Ardebili, F., et al., 2019. [The effectiveness of multimedia self-care education on burn patients' quality of life: An application of latent growth model (Persian)]. *Razi Journal of Medical Sciences,* 25(12), pp. 33-42. [Link]

Mohebbi, H., et al., 2018. Comparison of the effects of media-based and face-to-face cardiac rehabilitation training programs on self-efficacy in patients undergoing coronary artery bypass grafting. *Evidence Based Care Journal,* 8(2), pp. 67-77. [Link]

Moons, P. & Luyckx, K., 2019. Quality-of-life research in adult patients with congenital heart disease: Current status and the way forward. *Acta Paediatrica,* 108(10), pp. 1765-72. [PMID]

Moschovi, D., et al., 2020. Physical activity levels and self-efficacy of Greek children with congenital heart disease compared to their healthy peers. *Hellenic Journal of Cardiology,* 61(3), pp. 180-6. [DOI:10.1016/j.hjc.2019.01.002] [PMID]

Nedjat, S., et al., 2008. Psychometric properties of the Iranian interview-administered version of the World Health Organization's Quality of Life Questionnaire (WHOQOL-BREF): A population-based study. *BMC Health Services Research,* 8, pp. 61. [DOI:10.1186/1472-6963-8-61] [PMID] [PMCID]

Nikyar, B., et al. 2011. Prevalence and pattern of congenital heart disease among neonates in Gorgan, Northern Iran (2007-2008). *Iranian Journal of Pediatrics,* 21(3), pp. 307–12. [PMID]

Omidi, A., et al., 2015. [Effect of self-care education on self-efficacy in patients with chronic obstructive pulmonary disease in the Educational and Medical Centers of Hamadan University of Medical Sciences (Persian)]. *Avicenna Journal of Nursing and Midwifery Care,* 23(2), pp. 74-84. [Link]

Parker, R., et al., 2020. Impact of congenital heart disease on siblings: A review. *Journal of Child Health Care,* 24(2), pp. 297-316. [PMID] [PMCID]

Rahim, F., et al., 2008. Prevalence of congenital heart disease in iran: A clinical study. *Journal of Medical Sciences,* 8(6), pp. 547-52. [DOI:10.3923/jms.2008.547.552]

Sable, C., et al., 2011. Best practices in managing transition to adulthood for adolescents with congenital heart disease: The transition process and medical and psychosocial issues: a scientific statement from the American Heart Association. *Circulation,* 123(13), pp. 1454–85. [PMID]

Saha, A., Poddar, E. & Mankad, M., 2005. Effectiveness of different methods of health education: A comparative assessment in a scientific conference. *BMC Public Health,* 5, pp. 88. [PMID] [PMCID]

Saif, A. A., 2013. [*Modern educational psychology: Psychology of learning and education.* 7th ed. Tehran: Duran Publications (Persian)]. Tehran: Duran Publications. [Link]

Sherer, M., et al., 1982. The self-efficacy scale: Construction and validation. *Psychological Reports,* 51(2), pp. 663-71. [DOI:10.2466/pr0.1982.51.2.663]

Silva, A. M., et al., 2011. Quality of life of patients with congenital heart diseases. *Cardiology in the Young,* 21(6), pp. 670–6. [PMID]

So, S. C. Y., Li, W. H. C. & Ho, K. Y., 2019. The impact of congenital heart disease on the psychological well-being and quality of life of Hong Kong Chinese adolescents: A cross-sectional study. *Journal of Clinical Nursing,* 28(17-18), pp. 3158–67. [DOI:10.1111/jocn.14864] [PMID]

Survonen, A., et al., 2019. The psychosocial self-efficacy in adolescents with type 1 diabetes. *Nursing Open,* 6(2), pp. 514–25. [PMID] [PMCID]

Thomet, C., et al., 2018. Self-efficacy as a predictor of patient-reported outcomes in adults with congenital heart disease. *European Journal of Cardiovascular Nursing,* 17(7), pp. 619-26. [PMID]

Van Der Linde, D., et al., 2011. Birth prevalence of congenital heart disease worldwide: A systematic review and meta-analysis. *Journal of the American College of Cardiology,* 58(21), pp. 2241–7. [DOI:10.1016/j.jacc.2011.08.025] [PMID]

World Health Organization. Division of Mental Health., 1996. *WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment: Field trial version, December 1996.* Geneva: World Health Organization. [Link]

Yoon, S., et al., 2021. Effects of health education on adolescents' non-cognitive skills, life satisfaction and aspirations, and health-related quality of life: A cluster-randomized controlled trial in Vietnam. *PloS One,* 16(12), pp. e0259000. [DOI:10.1371/journal.pone.0259000] [PMID] [PMCID]