Original Article

Effectiveness of an Instructional Program on Practice of Patients' Safe Measures Post Implantable Cardioverter Defibrillator

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ABSTRACT

Objective: To ascertain the effectiveness of the instruction program on patients' practices about safe measures post implantable cardioverter defibrillator.

Study Design: A quasi-experimental study

Place and Duration of Study: This study was conducted at the Ibn–Al-Bitar Specialized Center, Baghdad city from 19th May 2023 to 16th February 2024.

Methods: Pre-test and post-test approaches are used for the groups (control and study). Sixty patients participated (30) in each group. Date was collected through the use of constructed program and instruments for the safe measures after ICD implantation, the study instrument included three sections: socio-demographic characteristics, medical information, and patients' practices regarding safe measures post-ICD implantation.

Results: The study group demonstrated a fair level of practice in safe activity and a good level of electrical devices, and magnetic devices domains, while in the control group, the domains were within fair level except the electrical devices were at poor level at pre-program. However, after the program implementation, the majority of study group had adequate total practice scores on the contrary the control group remained at a fair level.

Conclusion: The practices of patients regarding safe measures post ICD was fair level for both groups. After implementing the instructional program, the study members' practices increased to a respectable level. While the practices of the control group remained unchanged over the testing period.

Key Words: Instruction program, Safe measures, Implementable cardioverter defibrillator.

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INTRODUCTION

Sudden cardiac arrest (SCA) predominantly affects adult patients, particularly men over the age of 35. The associated risk factors can be categorized into four groups: clinical, societal, genetic, and psychological. To reduce the incidence of SCA, various therapeutic modalities, including antiarrhythmic medications and implanted cardioverter-defibrillators (ICDs), are utilized.[1]

The implanted cardioverter-defibrillator (ICD) monitors heart rhythms for potentially life-threatening arrhythmias characterized by excessive rates or irregular rhythms. It provides diagnostic information and treatment responses through low-energy pacing or high-energy shocks to terminate arrhythmias, known as appropriate shocks.[2] Although patients with ICDs receive routine information about their condition, they often feel that their concerns are not fully addressed. Many report that their doctors focus primarily on clinical and device-related issues, neglecting the social and psychological implications of living with an ICD and the availability of psychological support. Engaging in face-to-face conversations with patients prior to device implantation allows physicians to assess their emotional state and address any concerns.[3] Many patients had inadequate (knowledge and practice) regarding ICD and pacemaker education program performance (knowledge and practice) with improved knowledge regarding ICD implantation.[5,6] Managing cardiac devices with nursing tracking and avoiding common problems, avoiding dislocation, and educating patients about device use and maintenance.[6] Also, some patients restrict activities, including sex, driving, and socializing.[7] Understanding the potential implications and implementing an appropriate care program can greatly enhance patients' ability to adapt to their

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condition following device implantation.[8] Various factors, including mental health and comorbid conditions, can affect patients' ability to cope with and accept their cardiac devices. However, the quality and extent of education provided prior to the implantation procedure significantly influence patient outcomes and overall acceptance.[9,10] A significant gap in clinical practice exists that could be addressed to better support individuals with ICDs. Leveraging the knowledge and perspectives of patient partners can facilitate this improvement. The goal of this project was to develop and evaluate a teaching program designed to educate patients and assist them in adjusting to life with an ICD.

METHODS

A quasi-experimental design was performed from 19th May 2023 to 16th February 2024 at Ibn–Al-Bitar Specialized Center for Cardiac Surgery. pre-test and post-test approaches were used for the group (control and study group). Sixty patients were participated (30 patients) in each group. The instrument was composed of 3 sections; first portion covers socio-demographics, second part covers clinical characteristics of patients, and third part covers the patients' practices about safe measures post ICD, concerning safe measures instrument consists of three domains; the first domain is concerned with the patients' safety of daily activities: consists of 15 items, and the second was concerned with patients' safety of usage of various household and work-related devices: consisting of 8 items, last part ask patients about harmful equipment with strong electromagnetic fields with ICD devices: consist of 6 items. Each item scored on a 3-point Likert scale, according to the following: the total scores of the practice ranged from 0 – 69. One mark for each never answer, two for some time and three mark for the always answer. Poor practice level <50% of the total score (score 0 to less than 35). Fair practice level 50-75% of total scores (score 36-52). A good practice level is >75% of total scores (scores 53 to 69).[11] All the participants of the study in both groups were subjected to a pre-test. The participants of the study group were exposed to the instructional program after the pre-test immediately. The program was delivered by face-to-face as used previously based on previous educational and instructional interventions. Finally, after 4 weeks all the participants of both groups were exposed to the post-test. The program application takes 2 sessions each session scheduled to be for 20 minutes.

The questionnaire's validity was assessed by content validity index approach the result of the study (0.85) that the questionnaire is valid. Also, the program applies to 16 experts. The study tool was tested-retested for reliability. The patient's knowledge reliability coefficient was 81. SPSS 26 utilized for analyzing study data.

RESULTS

83.3% of participants in the study group were male, compared to 66.7% in the control group. 33.3% of the study group were under 54 years old, while 36.7% of the control group fell within the 54-66 age. Freelancers constituted 33.3% of the study group, whereas 43.3% of the control group were unemployed. 50% of the study group had completed primary education, with only 10% being illiterate, while 26.7% of the control group were secondary graduates. Marital status indicated that 83.3% of the study group and 80% of the control group were married.

Table No. 1: Distribution patients according to socio-demographic characteristics

Variable	Study Group (N=30)	Control Group (N=30)
Gender		
Male	25 (83.3%)	20 (66.7%)
Female	5 (16.7%)	10 (33.3%)
Age Groups		
18- less than 30	5 (16.7%)	3 (10%)
30- less than 42	2 (6.7%)	4 (13.3%)
42- less than 54	10 (33.3%)	8 (26.7%)
54- less than 66	7 (23.3%)	11 (36.7%)
66 & above	6 (20%)	4 (13.3%)
Occupation		
Employed	8 (26.7%)	4 (13.3%)
Retired	5 (16.7%)	8 (26.7%)
Freelancers	10 (33.3%)	5 (16.7%)
Unemployed	7 (23.3%)	13 (43.3%)
Education level		
Iilliterate	3 (10%)	3 (10%)
Read and write	1 (3.3%)	4 (13.3%)
Primary graduate	15 (50%)	6 (20%)
Medium graduate	2 (6.7%)	3 (10%)
Secondary graduate	2 (6.7%)	8 (26.7%)
Institute/College graduate	7 (23.3%)	6 (20%)
Marital status		
Single	2 (6.7%)	4 (13.3%)
Married	25 (83.3%)	24 (80%)
Widowed	2 (6.7%)	2 (6.7%)
Divorced	1 (3.3%)	-
Socio-economic level		
Low	7 (23.3%)	6 (20%)
Mild	18 (60%)	19 (63.3%)
High	5 (16.7%)	5 (16.7%)

A significant portion of both groups reported median income, with 60% in the study group and 63.3% in the control group. In terms of implantation duration, 30% of the study group had devices implanted for five years or longer, while 26.7% of the control group had implants for between six months and one year or for five years and above. 60% of the study group and

56.6% of the control group did not have chronic diseases. Among those with chronic conditions, 90% of the study group and 63.3% of the control group were on medication for those diseases.

Table No. 2: Distribution of patient's medical information who has an ICD device

Variable	Study Group (N=30)	Control Group (N=30)
Duration of implantation		
less than 3 month	6 (20%)	7 (23.3%)
3- less 6 month	2 (6.7%)	1 (3.3%)
6- less one year	6 (20%)	8 (26.7%)
1- less 5 years	7 (23.3%)	6 (20%)
5 years &above	9 (30%)	8 (26.7%)
Chronic disease		
Non	18 (60%)	17 (56.6%)
Diabetic mellitus	0	6 (20%)
Hypertension	5 (16.7%)	5 (16.7%)
Others	7 (23.3%)	2 (6.7%)
Take drugs to the chronic diseases		
Yes	27 (90%)	19 (63.3%)
No	3 (10%)	11 (36.7%)
Smoking		
Yes	5 (16.7%)	2 (6.7%)
No	25 (83.3%)	28(93.3%)

Additionally, 83.3% of the study group and 93.3% of the control group were non-smokers. The study group demonstrated a fair level of safe activities and a good level for both electrical and magnetic devices, with mean scores of 18.37, 18.40, and 15.10, respectively. In contrast, the control group exhibited fair levels across most domains, except for electrical devices, which fell into the poor level, with mean scores of 18.03, 15.63, and 17.97, respectively. After the program was applied, the study group reflected a good level across all practice domains, with mean scores of 20.40, 19.70, and 16.80, respectively. Meanwhile, the control group maintained a fair level in all domains except good level in magnetic devices domain, yielding mean scores of 18.53, 18.20, and 15.83, respectively (Table 3).

Figure 1 revealed a comparison of descriptive analysis of total patients' level of practice for both study groups, in the pre-and post-test. The finding indicated that (60%) of the study group population had a fair level before receiving the instructional program and an additional (40%) had a good level. Large effects and changes have been found after conducting the program the majority of patients (90%) had a good level of practice with the device, while (56.7%) of the control population had a fair level of practice at the pre-test and improved (60 %) in post-test and (40%) were good level of practices about the device.

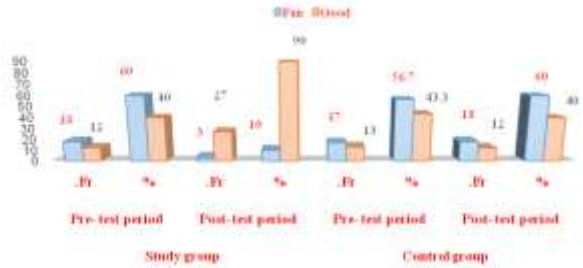

Figure No. 1: Evaluation of total patients' practices about the safe measures

Table No. 3: Descriptive analysis of patients' specific practice of safe measure for study and control groups before and after applying program

Specific knowledge of safe measure	Max score	Pre- test period				Post test period			
		Study group		Control group		Study group		Control group	
		M.S (SD)	Ass	M.S (SD)	Ass	M.S (SD)	Ass	M.S (SD)	Ass
Safe activity	27	18.37 (2.883)	Fair	18.03 (2.785)	Fair	20.40 (2.724)	Good	18.53 (2.501)	Fair
Electrical devices	24	18.40 (2.191)	Good	17.97 (2.671)	Poor	19.70 (2.380)	Good	18.20 (2.605)	Fair
Magnetic devices	18	15.10 (2.721)	Good	15.63 (2.470)	Good	16.80 (1.375)	Good	15.83 (1.877)	Good

DISCUSSION

The current study demonstrates that higher percentage of males in both the study and control groups align with findings from previous studies. Hussein & Mohammed[12] which found that largest percentage were males. The higher percentage of individuals aged 54-65 in the control group compared to the study group is consistent with the findings of a Mousa & Mansour[13] which reported that most of the age range was 48-55 years. Concerning the occupational status of the patients a study agree with present result which found (43.3%) of the sample had unemployed.[14] Half percent of the samples in the study group had a primary education level and twenty-six percent of the patients were secondary graduates for the control group, these findings supported a research that indicated 25.9% of patients were secondary school.[15] Also agree with a study which indicated that the most patients had ranged between high school and middle school 30% for each level.[16]

Sixty, and sixty-three percent of the samples in the both groups, were median income level, this data matches with a study that stated that 63.3% and 73.3% of study and control group patients, respectively, were median income level.[17] The result also shows that the mean duration of implantation of the ICD device was (33±3.103 months for the study group and 40±3.511 months for the control group). These findings align with Curtis et al[18] reported that the time since ICD implantation was 3.61±3.14 years. The majority of groups did not have a chronic disease. This indicates that the two groups were fairly similar in terms of their overall health status. In terms of specific chronic diseases, the prevalence of diabetes mellitus was 20% in the control group, had higher value compared to study group. This could suggest that there may be a higher risk of diabetes among the control group population, or other factors specific to the study group. The prevalence of hypertension was same in both groups, suggesting that groups are typical of the general population or that both groups have similar risk factor. This result is consistent with Ichikura et al[19] reported 16% of the samples had diabetes and 22.7% of the samples had hypertension. The individuals with ICD devices may have a higher prevalence of certain cardiac conditions, which could impact the overall health profile of study and control groups. The majority sample in both groups doesn't smoke. These results were supported by Iraqi studies, which found that the largest of his sample didn't smoking.[20,21]

Abd El-Aziz et al[22] reported that the home care management program improves knowledge and practices for patients with permanent pacemakers where 40.4% of participants exhibited satisfactory practices before the program, while 59.6% demonstrated satisfactory practices after the program. As well, a recent study agrees with our finding which found that patients' practice improved significantly both instantly and after 4 weeks, in comparison to the starting point, there were noticeable changes. Initially, the majority of patients had unsatisfactory overall practice but after post-educational intervention, 65.7% had satisfactory practice and 77.1% post 4 weeks of applying to the program, this result supported by Khalil et al[23] and Ahmed[24] discovered that the education program significantly improved patients' practice. As well, another study agrees with our finding and mentioned the high statistical significance of post-education patient performance and follow-up. Also, they reported that most of the sample scored well on all home environment categories except the magnetic field. Due to modern life, all patients have magnetic fields in their homes from TVs, mobile phones, recorders, computers, and hairdryers, so they must keep them at least 6 inches to 15 centimeters away.[25] The large number of patients expressed concerns regarding the high side effects of the ICD and, the limited use of microwaves. This result goes in the same line as our result in table 3 the result found poor practice in using microwave ovens.[1] In this regard, Mohamed et al[26] stated that a greater number of patients exhibited insufficient practice related to the pre-implementation education program for pacemaker placement, despite an improvement in their knowledge regarding permanent pacemaker implantation.

Recommendation: Comprehensive training programs that start in the pre-implantation period and continue into the post-implantation period should be organized, and focused on safe and unsafe activities after ICD.

CONCLUSION

The results revealed a fair level for both groups related patients' practice to safe measures post-ICD. After implementing the instructional program for the study group, members' practices had increased to a good level while the practices of the control group remained unchanged over the post-testing period.

Author's Contribution:

Concept & Design of Study:	Mohammed Kadhum Sadiq
Drafting:	Wafaa Abed Ali Hattab
Data Analysis:	Wafaa Abed Ali Hattab
Revisiting Critically:	Mohammed Kadhum Sadiq, Wafaa Abed Ali Hattab
Final Approval of version:	By all above authors

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REFERENCES

1. Zakeri MA, Sedri N, Bazmandegan G, Zakeri M, Safariyan M, Dehghan M. Patients' knowledge and concerns about using the implantable cardioverter defibrillator for the primary prevention of sudden cardiac death and its correlates: A cross-sectional study. Health Sci Reports 2022; 5(4): e698.
2. Force ZC. Differences in device acceptance in individuals with pacemakers and ICDs (Master's Thesis, East Carolina University), 2022.
3. Pedersen SS, Knudsen C, Dilling K, Sandgaard NF, Johansen JB. Living with an implantable cardioverter defibrillator: patients' preferences and needs for information provision and care options. Europace 2017; 19(6):983-90.
4. Sadaq MK. Patients' self efficacy and perception after implantable cardioverter defibrillator at cardiac centers in Baghdad City, University of Baghdad; 2017.
5. Jassam AK, Hassan HS. Effectiveness of an instructional program on practice of patients with

permanent pacemaker concerning self-care in baghdad teaching hospital. Turkish J Physiotherapy Rehab 2021;3(3):9141-9.
6. Matt V. Six pacemaker therapy nursing care plans. Pacemaker therapy: Nursing care plan. Nurses Labs 2019.
7. Xuan F, Ye L, Xiaomei Z. Qualitative study on life experience of patients after implantation of permanent pacemaker. Chinese Gen Prac Nursing 2017;15: 2820–22.
8. Razavi M, Khatiban M, Ahmadi F, Oshvandi K. Adaptation status and related factors in patients living with implantable cardioverter defibrillators. J Family Med Prim Care 2022;11:4467-72.
9. Pannag J, Martin L, Yost J, McGillion M, Carroll SL. Testing a nurse-led, preimplantation educational intervention for primary prevention implantable cardioverter-defibrillator candidates: a randomized feasibility trial. Eur J Cardiovasc Nurs 2021; 20(4):367–75.
10. Miller JL, Thylén I, Elayi SC, Etaee F, Fleming S, Czarapata MM, et al. Multi-morbidity burden, psychological distress, and quality of life in implantable cardioverter defibrillator recipients: results from a nationwide study. J Psychosom Res 2019;05(120):39-45.
11. Mohamed N, Sherif W, Abd El-Aziz M, Badran H. Effect of uremic pruritus educational intervention on knowledge level for hemodialysis patients. Mansoura Nursing J 2020;7(1): 93-101.
12. Hussein ZK., Mohammed, WK. Association between enhancing learning needs and demographic characteristic of patients with myocardial infarction. Iraqi Nat J Nursing Specialties 2022;35(2):17–21.
13. Mousa AM, Mansour K. Effectiveness of an instructional program concerning healthy lifestyle on patients' attitudes after percutaneous coronary intervention at cardiac centers in Baghdad city. Iraqi Nat J Nursing Specialties 2020;33(1):1-11.
14. Mathew J, Sharma A, Naik N, Gopichandran L. Physical and psychosocial concerns among patient living with implantable cardioverter defibrillator attending tertiary health care facility. Asian J Nursing Educ Res 2020;10(4):463-70.
15. Karczewska O, Młynarska A. Factors that cause concerns after cardioverter defibrillator implantation. Int J Environ Res Public Health 2021;18:6095.
16. Jassam AK, Hassan HS. Effectiveness of a self-care instructional program on the satisfaction for patients with permanent pacemaker implementation in Baghdad Teaching Hospital. JCDR 2021;12(5):81-90.
17. Allam LE, Nabih MA, El-Missiry MA. The psychological impact of permanent cardiac pacemakers on pediatric patients and their parents: a case control study. Ind Heart J 2018;70(6):872–8.
18. Curtis AF, Roth AJ, Sears SF, Conti JB, Berry RB, Dzierzewski JM, et al. Cognitive performance in patients with implantable cardioverter defibrillators: Associations with objective sleep duration, age and anxiety. J Sleep Res 2019; 28(4):e12810.
19. Ichikura K, Kobayashi S, Matsuoka S, Suzuki T, Nishimura K, Shiga T, et al. Avoidance behavior associated with depressive symptoms in patients with implantable cardioverter defibrillators. IJCHP 2017; 17(1):1–8.
20. Isam SR, Hassan HS. Effectiveness of cardiac rehabilitation instructional program on health-related quality of life for patients undergone coronary artery bypass graft surgery. Iraqi Nat J Nursing Specialties 2023;36(1):59–70.
21. Mukhlif HA, Qassim WJ. Assessment of old age behaviors toward cardiovascular health promotion. Iraqi Nat J Nursing Specialties 2023;36(1):26–34.
22. Abd El-Aziz, S, Abd El-Megeed H, Abd El-Mordy M, Sabry S. Home-care program for patients with permanent pacemaker. Benha J Appl Sci 2023; 8(4): 147-56.
23. Khalil H, Soliman M, Ahmed H, Hamza E. Effect of educational program on outcomes of patients undergoing permanent pacemakers' implantation. Evidence-Based Nursing Res 2020;2(4):13.
24. Ahmed WM. Nursing care of the patient with an artificial pacemaker, Noseleutike J 2019;31(139): 43-54.
25. Yossif HA, Abd El-aal EM. Home care for patients with permanent pacemaker insertion. J Nursing Health Sci 2017;6(4):49-57.
26. Mohamed A, Shreif W, Mohamed H, Mohamed A, Maaty A. Effectiveness of educational program on knowledge and practice of patients undergoing permanent pacemaker. IOSR-JNHS 2016;5(6): 72-83.