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Knowledge and Practice Regarding Self-care Management among Patients with Permanent Pacemaker at Cardiac Center

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ABSTRACT

Background: Permanent pacemaker can be implanted as a life shaving measures for the patients with cardiovascular disease. Complications of permanent pacemaker are preventable if the patients have adequate knowledge regarding its usage, complications, and precautionary measures. The objective of this study was to find out the knowledge and practice regarding self-care management among patients with permanent pacemaker.

Methods: A descriptive, cross-sectional study was adopted among patients with permanent pacemaker at Outpatient Department of Manmohan Cardiothoracic Vascular and Transplant Center, Maharajgunj, Kathmandu. A total of 98 patients were selected by using non-probability consecutive sampling technique. Data were collected using structured interview schedule.

Results: The study revealed that 40.8% of patient had adequate knowledge and 32.7% of patient had good practice regarding self-care management of permanent pacemaker. There was significant association between level of knowledge with age (p=.006), sex (p=.005), ethnicity (p=.045), education status (p=<.001) and regular exercise (p=.031) after permanent pacemaker implantation (PPI). Likewise, level of practice was significantly associated with sex (p=<.001), education status (p=<.001), occupation (p=<.001) and regular exercise (p=<.001) after PPI. The knowledge score and practice score were moderately positively correlated.

Conclusions: More than half of the patient had inadequate knowledge and nearly half of the patients followed poor practice regarding self-care management of permanent pacemaker.

Keywords: Knowledge; permanent pacemaker; practice; self- care management

INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of death in the world and half of the cases of CVD are estimated to occur in Asia.[1] Permanent pacemaker implantation (PPI) can be life shaving measures for the patients with cardiovascular disease.[2] It is one of the most commonly performed interventions on the heart.[3] Permanent pacemakers are commonly inserted in patient with atrioventricular (AV) block, atrial fibrillation with slow ventricular response, bundle branch block, cardiomyopathy, heart failure, sinoatrial(SA) node dysfunction and dysarhythmias.[4]

Most of the complications are preventable if the patients get information regarding the precautionary measures of permanent pacemaker. When patients had sufficient knowledge of pacemaker care, they take care themselves better with right behaviors after discharge.[5] A study conducted among 40 patients at Benha University Hospital and National Heart Institute, Cairo, Egypt to assess a home care for patients with permanent pacemaker; revealed that majority (87.3%) of patients had inadequate knowledge score and 61.7% had unsatisfied total practices score of self-care management of permanent pacemaker.[6] A patient not having knowledge about permanent pacemaker is one of the serious problems. So, the study was aimed to find out the knowledge and practice regarding self-care management among patients with permanent pacemaker.

METHODS

A quantitative descriptive cross-sectional study design was adopted to find out knowledge and practice regarding self-care management among patients with permanent pacemaker. The data were collected from 11th August 2019 AD to 6th September 2019AD in Manmohan Cardiothoracic Vascular and Transplant Center (MCVTC),

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Maharajgunj, Kathmandu. In this study both male and female patients aged 18 years and above who had an implanted pacemaker for at least one month and were willing to participate in the study were included in the study. Those patients who had physical and psychological disability and who had same pacemaker for more than 15 years were excluded from the study. The total sample size was 98 in number and non-probability, consecutive sampling technique was applied for this study. Non probability, consecutive sampling technique was used for this study. Total sample that met the designated criteria and attended the OPD during data collection period 11th August 2019 to 6th September 2019 was included in this study. The researcher collected the data from all those patients who meet the criteria of the study.

Structured interview schedule was developed by researcher herself based on extensive literature review. The research instrument was consisted of three parts. First part consisted of questions related to socio-demographic information, disease related variables and behavior pattern related variables. Second part consisted of the 22 multiple choice questions related to knowledge regarding self-care management of permanent pacemaker such as meaning of pacemaker, expected complications, pulse measurement, signs and symptoms of malfunction, precautionary measures, diet, exercise and follow-up visits. Whereas, third part consisted of check list related practice regarding self-care management of permanent pacemaker which includes pulse measurement, diet, exercise, safety measures, carrying of identity card, medications and follow up visit with cardiologist. The content validity of the instrument was established by extensive literature review and consultation with the research adviser and cardiologists. Pre-testing of an instrument was done in Shahid Gangalal National Heart Center, Kathmandu and these samples were excluded from the study. Ethical clearance was taken from Chitwan Medical College- Institutional Review Committee (CMC-IRCRef:2076/077/08). The objectives of the study and data collection process were explained to the respondents and written informed consent was taken prior to data collection. The data were collected from each respondent through face to face interview method by using the Nepali version instruments. Average three to four patients were interviewed each day and each interview was taken for 25 to 30 minutes.

The data were coded and entered into IBM SPSS version 20 for window. Data were analyzed using descriptive statistics such as frequency, percentage, mean and standard deviation to identify the patient's socio-demographic, disease related characteristics, behavior patterns as well as level of knowledge and practice regarding self-care management among patients with permanent pacemaker. Chi-square test was applied to find out the associations between level of knowledge and practice regarding self-care management of permanent pacemaker and selected variables. Likewise, Spearman's rank correlation coefficient was calculated to find out the relationship between knowledge and practice score regarding self-care management of permanent pacemaker. All the statistical significant was set at p value <0.05.

RESULTS

This study found out that the age of respondents ranged from 24-85 years with the median age and IQR was 70 (76-61) years. More than half (58.2%) of the respondents were male and 85.7% were married. Regarding disease related characteristics, nearly two third (62.2%) of the respondents were diagnosed with complete heart block whereas nearly one third (30.6%) were with ventricular heart disease. The commonest symptoms were dizziness (73.5%) experienced by respondents before PPI, followed by fainting attack (55.1%) and difficulty in breathing (30.6%). More than half (52.0%) of the respondents' duration of PPI was 1 to 12 months. Most of the respondents (87.8%) had the single chamber. Only two percent of respondents experienced wound infection as a complication of PPI. Regarding family history of illness majority of respondents had history of hypertension (61. 2%) and 15.3% of respondents had history of hypertension in the family. Regarding behavior patterns, nearly half of the respondents (48.0%) had habit of smoking before PPI whereas only 7.1% were continuing smoking even after PPI., tobacco chewing (20.4%vs. 7.1%) and alcohol intake (29.6%vs. 5.1%) habits were decreased among patients after PPI whereas habit of regular exercise (37.8%vs. 46.9%) was increased after PPI.

Table 1. Knowledge regarding Self-care Management of Permanent Pacemaker among Respondents (n=98).

Statement	Correct Response	
	No.	%
Function of heart is to pump blood throughout the body	81	82.7
Normal pulse rate is 60-100/min	33	33.7
Function of PPI is to regulate heart rate	95	96.1
Life span of battery is 5-10 years	82	83.7
Site of pulse measurement is wrist	94	95.9
Pulse is checked for 60 sec each time	13	13.3
Pulse is checked daily	19	19.4

Dizziness, palpitation and difficulty of breathing are the s/s malfunction	91	92.9
Bleeding and infection are the early complications of PPI	13	13.3
Wire displacement is a delayed complication of PPI	29	29.6
Healthy heart diet contains low fat and low sodium	94	95.9
Fruit and vegetables contain low fat and high fiber diet	96	98.0
Caffeinated beverage should be avoided	54	55.1
Opposite side of PPI is an appropriate side of holding phone/mobile.	78	79.6
Electrical device is kept in 6inch/15cm from PPI side	9	9.2
Refrigerator is a safe equipment for PPI patients	67	68.4
MRI is unsafe investigation for PPI patients	35	35.7
Generator is unsafe to use for PPI patients	77	78.6
Metal detector is unsafe to use for PPI patients	38	38.8
Weight lifting is unsafe exercise	88	89.8
Permanent pacemaker card is important to carry	23	23.5
Usual time of follow up visit is 3 to 6 months	55	56.1

Table 2. Level of Knowledge regarding Self-care Management of Permanent Pacemaker among Respondents (n=98).

Level of Knowledge	Number	Percentage
Adequate (≥12.08)	40	40.8
Inadequate (<12.08)	58	59.2
Total	98	100.0

Mean knowledge score (SD) = 12.08 (3.663), Min obtain score - 6, Max obtain score -20, Possible score (0 -22)

Table 3. Association between Level of Knowledge regarding Self-care Management of Permanent Pacemaker and Socio-demographic Characteristics of Respondents (n=98).

Variables	Level of Knowledge		χ^2 test	p value
	Adequate No. (%)	Inadequate No. (%)		
Age				
Middle age	13(68.4%)	6(31.6%)	7.435	.006
Old age	27(34.2%)	52(65.8%)		
Sex				
Male	30 (52.6)	27 (47.4)	7.873	.005
Female	10 (24.4)	31 (75.6)		
Residence				
Rural Municipality	7(36.8)	12(63.2)	0.154	.625
Municipality	33(41.8)	46(58.2)		
Ethnicity				
Brahmin	18(58.1)	13(41.9)	6.199	.045
Chhetri	7(26.9)	19(73.1)		
Janjati	15(36.6)	26(63.4)		
Religion				
Hindu	38(42.2)	52(57.8)	0.902	.466€
Non Hindu	2(25.0)	6(75.0)		
Marital status				
Married	40(47.6)	44(52.4)	11.264	.001€
Widowed/ widower	0(0.0)	14(100.0)		
Education Status				
Illiterate	3(10.7)	25(89.3)	31.193	<.001
Basic education	17(36.2)	30(63.8)		
Secondary education and above	20(87.0)	3(13.0)		
Occupation				
Household work	13(27.1)	35(72.9)	7.518	.057
Businessman	12(57.1)	9(42.9)		
Retried	9(52.9)	8(47.1)		
Others*	6(50.0)	6(50.0)		

*Level of significance at 0.05, €=Fisher's exact test, *others occupation- service holder, farmer*

Table 4. Practice regarding Self-care Management of Permanent Pacemaker among Respondents (n=98).

Practice Items	Correct Response	
	No.	(%)
Monitor pulse daily	9	9.2
Measure a pulse full minute	9	9.2
Wound site clean and dry	98	100.0
Eat low fat diet	64	65.3
Eat low salt diet	64	65.3
Eat high fiber diet	92	93.9
Avoid caffeine diet like coffee, tea	31	31.6
Exercise regularly	46	46.9
Walk regularly	46	46.9
Take rest after exercise	46	46.9
Avoid lifting weight	23	23.5
Hold phone opposite side of PPI	73	74.5

Carry permanent pacemaker identity card	23	23.5
Keep a mobile in pant/bag	98	100.0
Wear loose cloths	98	100.0
Sleep opposite side of PPI	29	29.6
Avoid keeping any things on site of PPI	98	100.0
Avoid rubbing over PPI site	97	99.0
Use of household electrical appliance, television	96	98.0
Use of refrigerator	43	43.9
Use of remote control	94	95.9
Use of iron	42	42.9
Use of radio	92	93.9
Use of electrical water motor	84	85.9
Use of electrical wall switch	96	98.0
Protect from trauma while doing physical/spots activities	98	100.0
Tell medical persons before undergone any medical procedure	85	86.7
Tell security guard in airport/bank	77	78.6
Take medication as prescribed by cardiologist	98	100.0
Follow all instruction given by cardiologist/nurse	98	100.0
Regular follow up visit	79	80.6

Table 5. Level of Practice regarding Self-care Management of Permanent Pacemaker among Respondents (n=98).

Level of Practice	Number	Percentage
Good practice (≥75%)	32	32.7
Fair practice (50 to 75%)	22	22.4
Poor practice (<50%)	44	44.9
Total	98	100.0

Possible Score = 0-31

Table 6. Association between Level of Practice regarding Self-care Management of Permanent Pacemaker and Socio-demographic Characteristics of Respondents (n=98).

Variables	Level of Practice			x^2 test	p value
	Good No. (%)	Fair No. (%)	Poor N0. (%)		
Age					
Middle age	7(36.8)	6(31.6)	6(31.6)	1.993	.380
Old age	25(31.6)	16(20.3)	38(48.1)		
Sex					
Male	29(50.9)	8(14.0)	20(35.1)	21.075	<.001
Female	3(7.3)	14(34.1)	24(58.5)		
Residence					
Rural Municipality	2(10.5)	5(26.3)	12(63.2)	5.441	.066
Municipality	30(38.0)	17(21.5)	32(40.5)		
Ethnicity					
Brahmin	13(41.9)	7(22.6)	11(35.5)	2.507	.643
Chhetri	7(26.9)	5(19.2)	14(53.8)		
Janjati	12(29.3)	10(24.4)	19(46.3)		
Religion					
Hindu	31(34.5)	21(23.3)	38(42.2)	3.266	.281€
Non Hindu	1(12.5)	1(12.5)	6(75.0)		
Marital status					
Married	22(38.1)	29(22.6)	33(39.3)	8.422	.002€
Widowed/ widower	0.0	3(21.4)	11(78.6)		
Education Status					
Illiterate	4(14.3)	8(28.6)	16(57.1)	20.831	<.001
Basic education	12(25.5)	10(21.3)	25(53.2)		
Secondary education and above	16(69.6)	4(17.4)	3(13.0)		
Occupation					
Household work	6(12.5)	14(29.2)	28(58.3)	22.682	<.001
Businessman	8(38.1)	4(19.0)	9(42.9)		
Retried	12(70.6)	1(5.9)	4(23.5)		
Others*	6(50.0)	3(25.0)	3(25.0)		

*Level of significance at 0.05, €= Fisher's exact test *others occupation- service holder, farmer*

DISCUSSION

This study found that in regard to overall level of knowledge, more than half (59.2%) of the patients had inadequate knowledge about self-care management of permanent pacemaker. This finding is consistency with the studies of homecare knowledge among patients with PPI in the studies done in Egypt by Hanaa and Ebtisam[6] and in India by Antony.[7]

Regarding items wise knowledge, the majority of the patients had knowledge about the function of the heart is to pump the blood throughout the body (82.7%), function of permanent pacemaker is to regulate the heartbeat (96.1%), life span of battery and its replacement (83.7%)

and signs and symptoms of permanent pacemaker malfunction (92.2%). Similarly, 95.5% of patients knew about the site of pulse measurement whereas 33.7% of patients knew the normal pulse rate and very few patients knew about the duration of pulse measurement in each time (13.3%) and frequency of pulse measurement (19.4%). Likewise, few patients (13.3%) had knowledge about early complication and only 29.6% knew about late complication of PPI. This finding is consistent with the study conducted in Egypt by Hanaa and Ebtisam.[6]

On safety measures, majority of the patients had knowledge about the appropriate side of holding mobile/ phone (79.6%) and they knew that weight lifting (89.8%), the generator (78.6%), metal detector (38.8%) and MRI (35.7%) are unsafe for the PPI patients. The MRI related knowledge was supported by the study conducted in Turkey by Yildiz et al.[8] in which 57% of patients knew that MRI is unsafe procedure for PPI. Few patients (23.5%) of the study had knowledge about the importance of carrying permanent pacemaker identity card and 9.2% had knowledge about electrical device should be kept 6inch/15cm away from PPI site.

In the present study, more than half of the patients (56.1%) had knowledge about the usual time of follow up. This finding is consistent with the study conducted in Egypt by Hanaa and Ebtisam[6] in which 57.5% of patients knew about it. However, the study conducted in Egypt by Nasr et al.[9] showed lower percentage knowledge (14.3%) among patients about the usual time of follow up visit. This difference in finding might be due to inclusion of sample from different education background. In the present study only 28.6% of patients were illiterate but in the study done by Nasr et al.[9] in which nearly two thirds of patients were illiterate which does not match the current study finding.

This study found that 32.7% of patients had good practice, 22.4% had fair practice and 44.9% had poor practice regarding self-care management of permanent pacemaker. This finding is consistent with the finding of the studies conducted in Egypt by Hanaa and Ebtisam[6] in which 38.3% of patient had satisfactory practice and 61.7% of patient had unsatisfactory practice.

Regarding items wise practice, cent percent of patients of this study kept their wound site clean and dry, kept mobile in pant pocket/bag, wore loose clothes, avoided keeping things on the PPI site, protected trauma while doing physical/sports activities and followed the instructions given by cardiologist/nurse. Similarly, almost all patients avoided rubbing on the PPI site (99.0%) and also avoided using household electrical appliances such as television (98.0%), remote control (95.9%), radio (93.9%), electrical water motor (85.9%) and electrical wall switch (98.0%). However, nearly half of patients used refrigerator and iron (43.9%, 42.9%) respectively. This finding is not consistent with the study conducted in Karachi, Pakistan by Aqeel et al.[10] in which more than 50.0% of patients considered unsafe using household electrical appliances like television and electrical wall switches except iron.

In this study, very few (9.2%) patients monitored pulse daily. Pulse measurement related practice was supported by the study conducted in Egypt by Hanaa and Ebtisam[6] in which 20% of patients used to measure pulse daily. The researcher interpreted that patients has got low practice score regarding pulse monitoring; this might be due to lack of awareness towards need of self-monitoring habit.

On precautionary measures, 29.6% of patients were sleeping opposite to the site of PPI. However, the studies conducted in Karachi, Pakistan by Aqeel et al.[10] and in French by Amara et al.[11] revealed the higher percentage (70% and 58% respectively) of patients sleeping on the opposite site of the PPI. Likewise, 86.7% of patients used to inform about the PPI to the medical personnel before undergoing any medical procedure and 78.6% of patients told security guard in airport/bank that they have PPI and 74.5% of patients used to hold the phone opposite to the site of PPI. However, only less than quarter of patients avoided weight lifting (23.5%).

Carrying identity card is important for the patients with permanent pacemaker to get immediate treatment in case of need. This study showed that 23.3% of patients carried permanent pacemaker identity card. In contrast, the study conducted in Athens by Tsami et al.[12] and in Egypt by Hanaa and Ebtisam[12] found that 78.0% and 70.0% of patient respectively carried pacemaker identity card.

Follow up visit is equally important for patient with PPI. Most of the patients (80.6%) attended regular follow- up visit. The follow up related practice was supported by the studies conducted in Athens by Tsami et al.[12] and in Egypt by Hanaa & Ebtisam[6] in which 80.0% and 60.0% of patients respectively attended regular visit after PPI.

In this study, age *(p*=.006), sex *(p*=.005), ethnicity *(p*=.045) and education status *(p*=<.001) and history of regular exercise (*p*=.031) after PPI were associated with level of knowledge. This finding is inconsistence with the finding of the study conducted in India by Sreelekshmi.[13] This study showed that level of knowledge regarding self-care management of PPI is not associated with

residence (p=.625), religion (p=.466[€]), occupation (p=.057), disease related variables and behavior patterns of patients. Similar finding was also reported in Egypt by El-dein et al.[14]

This study found moderate positive relationship between knowledge and practice score regarding self-care management of permanent pacemaker. This finding was supported by the studies conducted in Egypt by Mohamed et al.[15] and Hanaa and Ebtisam[6] in which knowledge score and practice score were positively correlated. This indicated that the patients who had higher knowledge score perform better practice regarding self-care management of permanent pacemaker.

The limitation of this study was that it was carried out in single center; Manmohan Cardiothoracic Vascular and Transplant Center, Maharajgunj, Kathmandu. So it may not be generalized to other settings.

CONCLUSIONS

It is concluded that more than one third of patients have adequate knowledge and only one third of patient have good practice regarding self-care management of permanent pacemaker. Age, sex, ethnicity, education status and history of exercise after PPI are associated with the knowledge regarding self-care management of permanent pacemaker. Likewise, sex, education status, occupation and history of regular exercise after PPI are associated with the practice regarding self-care management of permanent pacemaker. The knowledge score and practice score are moderately positively correlated.

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