A Comparative Study to Assess the Effectiveness of Whats App Group and Information Booklet Regarding Cardiac Rehabilitation Among Cardiovascular Disease Patients in Selected Hospitals of The City.”

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***Abstract*—Cardiac rehabilitation is "the sum of activity and interventions required to ensure the best possible physical, mental, and social conditions so that patients with chronic or post-acute cardiovascular disease by their own efforts, preserve or resume their proper place in society and lead an active life".[1] Cardiac rehabilitation is a multidisciplinary program that includes exercise training, cardiac risk factor modification, psychosocial assessment, and outcomes assessment. Exercise training and other components of cardiac rehabilitation are safe and beneficial and result in significant improvements in quality of life, functional capacity, exercise performance, and heart failure related hospitalizations in patients with heart failure. Despite outcome benefits, cost-effectiveness, and strong practice guideline recommendations, cardiac rehabilitation remains underused. Clinicians, health care leaders, and payers should prioritize incorporating cardiac rehabilitation as part of the standard of care for patients with heart failure. The high incidence and prevalence of myocardial infarction and cardiovascular disease, surveillance and uptake of structured cardiac rehabilitation programs in India are low, and data on cardiac rehabilitation utilization at state and national levels are limited. Evidence from global and regional surveys suggests that a very small fraction of eligible post-myocardial infarction patients (<10 %) in low- and middle-income settings, including India, access formal cardiac rehabilitation services, with barriers such as limited availability, low referral rates, cost, and lack of awareness contributing to poor uptake. OBJECTIVES OF STUDY PRIMARY To compare the effectiveness of what app group and information booklet regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city. SECONDARY OBJECTIVES To assess the pre-test level of knowledge regarding cardiac rehabilitation among cardiovascular disease patients in what app group and information booklet. To assess the post-test level of knowledge regarding cardiac rehabilitation among cardiovascular disease patients after whats app group education and information booklet. To determine the association between post-test level knowledge regarding cardiac rehabilitation with their selected demographic variables among cardiovascular disease patients in what app group and information booklet. METHODOLGY A quantitative research approach was selected a comparative study to assess the effectiveness of whats app group and information booklet regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city. A comparative descriptive research design was used to assess the effectiveness of whats app group and information booklet regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city. The study was conducted in Selected hospital of city. In the present study sample is Patients with myocardial infraction in selected hospitals Demographic data comprised of 8 items seeking information on demographic data such as Age, Religion, Gender, Marital status, Education qualification, Occupation, Family history of heart disease, Dietary habit.**

The reliability was established by Split half method. So, in split half method the Kuder and Richardson Formula 20 method of reliability, it is found to be 0.8337, Henes, it is reliable to the instrument. RESULTS The overall mean WhatsApp group and information booklet group knowledge scores of subjects which reveals that post-test mean knowledge score of WhatsApp group was higher 21.08 with SD of ±2.258 when compared with mean post-test mean knowledge score of information booklet group was 20.60 with SD of ±1.985. The statistical

Student's paired 't' test was applied at 5% level of significance. The tabulated value for n = 40-1 i.e. 39 Degree of freedom was 39 is that 2.021. The calculated value i.e. 0.936 was much lower than the tabulated value at 5% level of significance. For overall knowledge score of subjects which was statically not acceptable level of significance. Hence, it was statistically interpreted that effectiveness of post-test knowledge score on WhatsApp group and information booklet group regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city effective.

I. INTRODUCTION

Cardiac rehabilitation is "the sum of activity and interventions required to ensure the best possible physical, mental, and social conditions so that patients with chronic or post-acute cardiovascular disease by their own efforts, preserve or resume their proper place in society and lead an active life".[1] Cardiac rehabilitation is a multidisciplinary program that includes exercise training, cardiac risk factor modification, psychosocial assessment, and outcomes assessment. Exercise training and other components of cardiac rehabilitation are safe and beneficial and result in significant improvements in quality of life, functional capacity, exercise performance, and heart failure related hospitalizations in patients with heart failure. Despite outcome benefits, cost-effectiveness, and strong practice guideline recommendations, cardiac rehabilitation remains underused. Clinicians, health care leaders, and payers should prioritize incorporating cardiac rehabilitation as part of the standard of care for patients with heart failure. The fundamental components of cardiac rehabilitation include initial patient evaluation, individualized exercise prescription, education on cardiovascular health, dietary and nutritional guidance, psychosocial counselling, and systematic management of modifiable risk factors such as smoking, hypertension, diabetes, dyslipidemia, and excess body weight.[4] Among these, exercise training serves as the cornerstone for improving functional capacity and cardiorespiratory fitness, while educational interventions enhance patient knowledge, self-efficacy, and adherence to prescribed therapies. A programmed instruction booklet was developed for patients who were hospitalized after myocardial infarction. The booklet included basic information on cardiac, risk factors, diet, exercise, and medications. The effectiveness of such materials has been demonstrated in relation to a range of outcomes including knowledge acquisition.[24] booklets remain a valuable complementary tool. Booklets provide a written reference that patients can consult at their own pace, offering detailed information on various aspects of heart failure management, such as dietary recommendations, medication schedules, and warning signs of worsening symptoms. They can also include diagrams, charts, and checklists to facilitate their understanding and application of the information. Furthermore, booklets can be customized to reflect the cultural and linguistic diversity of the patient population, ensuring that the content is accessible and relevant to all. The high incidence and prevalence of myocardial infarction and cardiovascular disease, surveillance and uptake of structured cardiac rehabilitation programs in India are low, and data on cardiac rehabilitation utilization at state and national levels are limited. Evidence from global and regional surveys suggests that a very small fraction of eligible post-myocardial infarction patients (<10 %) in low- and middle-income settings, including India, access formal cardiac rehabilitation services, with barriers such as limited availability, low referral rates, cost, and lack of awareness contributing to poor uptake. Traditionally, patient education has been delivered using information booklets, which provide structured guidance regarding diet, exercise, medication schedules, and symptom monitoring. Booklets offer a tangible reference that patients can consult at their own pace, and they can be customized to reflect cultural and linguistic diversity, making them accessible and relevant to different patient populations. Despite their advantages, booklets are static and lack interactive engagement, which may reduce long-term adherence to lifestyle modifications and cardiac rehabilitation programs.[43,44]With the widespread availability of smartphones, digital health interventions have emerged as promising tools to improve patient education and engagement. Platforms like WhatsApp enable real-time communication, group interactions, multimedia sharing, and peer support, which can enhance knowledge retention, adherence, and motivation among post- myocardial infarction patients.[45,46]Recent studies have demonstrated that WhatsApp-based interventions can improve self-care behaviors, medication adherence, and participation in cardiac rehabilitation programs

II. OBJECTIVES OF THE STUDY

PRIMARY OBJECTIVES:

To compare the effectiveness of what app group and information booklet regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city.

SECONDARY OBJECTIVES:

1. To assess the pre-test level of knowledge regarding cardiac rehabilitation among cardiovascular disease patients in what app group and information booklet.
2. To assess the post-test level of knowledge regarding cardiac rehabilitation among cardiovascular disease patients after whats app group education and information booklet.
3. To determine the association between post-test level knowledge regarding cardiac rehabilitation with their selected demographic variables among cardiovascular disease patients in what app group and information booklet.

III. MATERIALS AND METHOD

A quantitative research approach was selected a comparative study to assess the effectiveness of whats app group and information booklet regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city. A comparative descriptive research design was used to assess the effectiveness of whats app group and information booklet regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city. The independent variables in the study are Whats app group education on cardiac rehabilitation and Information booklet on cardiac rehabilitation The Dependent variables in the study is Knowledge of myocardial infraction patients regarding cardiac rehabilitation. The study was conducted in Selected hospital of city. The rationale for selecting this setting was a lack of knowledge among cardiovascular disease patients, administrative approval, co-operation and availability of subjects. In the present study sample is Patients with myocardial infraction in selected hospitals of the city were the sample for proposed research study. Based on the objectives of the study, a structured questionnaire was prepared to evaluate the knowledge regarding cardiac rehabilitation before and after intervention. To obtain the content validity of the tool, the prepared tool with the synopsis, whats app group information and information booklet on cardiac rehabilitation. evaluators response sheet and content validity certificate were be submitted to 10 experts in the field of medical surgical nursing. The reliability was established by Split half method. So, in split half method the Kuder and Richardson Formula 20 method of reliability, it is found to be 0.8337, Henes, it is reliable to the instrument. The investigator had obtained permission from Institutional Ethical committee for the proposed research studies.

IV. RESULT

SECTION A

Distribution of subjects in relation to their demographic variables n=80

demographic variables	WhatsApp Group (N=40)		Information Booklet Group (N=40)	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age in Years				
25 – 35 Years	10	25	08	20
36 – 45 Years	13	32.5	08	20
46 – 55 Years	13	32.5	15	37.5
56 and above	04	10	09	22.5
Religion				
Hindu	23	57.5	14	35
Muslim	02	05	03	7.5
Buddhist	06	15	09	22.5
Christian	07	17.5	08	20
Others	02	05	06	15
Gender				
Male	23	57.5	29	72.5
Female	17	42.5	11	27.5
Other	00	00	00	00
Marital Status				
Married	26	65	24	60
Unmarried	07	17.5	09	22.5
Divorced	06	15	06	15
Widow	01	2.5	01	2.5
Other	00	00	00	00
Educational Qualification				
Primary Education	01	2.5	03	7.5

Secondary Education	09	22.5	08	20
er Secondary Education	12	30	07	17.5
Graduation	08	20	15	37.5
Post Graduation	10	25	07	17.5
Occupation				
Unemployed	08	20	07	17.5
Self-Employed	11	27.5	12	30
Government Employee	06	15	10	25
Private Employee	12	30	08	20
Retired	03	7.5	03	7.5
Family History of Heart Disease				
Yes	20	50	21	52.5
No	20	50	19	47.5
Dietary Habit				
Vegetarian	09	22.5	12	30
Non-Vegetarian	10	25	03	7.5
Mixed Diet	21	52.5	25	62.5

SECTION B

ASSESSMENT OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE SCORE REGARDING CARDIAC REHABILITATION AMONG CARDIOVASCULAR DISEASE PATIENTS ON WHATSAPP GROUP

Level of knowledge score	Score Range	Percentage score	Pre-test Knowledge Score		Post-test Knowledge Score	
			Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Poor	0-5	0-20%	17	42.5	00	00
Average	6-10	21-40%	19	47.5	00	00
Good	11-15	41-60%	04	10	01	2.5
Very Good	16-20	61-80%	00	00	14	35
Excellent	21-25	81-100%	00	00	25	62.5
Mean ±SD knowledge score			6.40 + 2.799		21.08 + 2.258	
Mean % knowledge score			25.6%		84.3%	
Minimum score			01		12	
Maximum score			15		25	

SECTION C

ASSESSMENT OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE SCORE REGARDING CARDIAC REHABILITATION AMONG CARDIOVASCULAR DISEASE PATIENTS ON INFORMATION BOOKELT GROUP.

Level of knowledge score	Score Range	Percentage score	Pre-test Knowledge Score		Post-test Knowledge Score	
			Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Poor	0-5	0-20%	17	42.5	00	00
Average	6-10	21-40%	19	47.5	00	00
Good	11-15	41-60%	04	10	01	2.5
Very Good	16-20	61-80%	00	00	14	35
Excellent	21-25	81-100%	00	00	25	62.5
Mean ±SD knowledge score			6.40 + 2.799		21.08 + 2.258	
Mean % knowledge score			25.6%		84.3%	
Minimum score			01		12	
Maximum score			15		25	

SECTION D

ANALYSIS OF EFFECTIVENESS OF KNOWLEDGE SCORE ON WHATSAPP GROUP AND INFORMATION BOOKLET GROUP REGARDING CARDIAC REHABILITATION AMONG CARDIOVASCULAR DISEASE PATIENTS IN SELECTED HOSPITALS OF THE CITY.

(n=40)

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre-Test	6.40	2.799	14.68 + 3737	24.833	0.0001 S.P<0.05
Post-Test	21.08	2.258			
P<0.05 level *significant					

SECTION E

COMPARISON OF POST-TEST KNOWLEDGE SCORE ON WHATSAPP GROUP AND INFORMATION BOOKLET GROUP REGARDING CARDIAC REHABILITATION AMONG

CARDIOVASCULAR DISEASE PATIENTS IN SELECTED HOSPITALS OF THE CITY
(n=40)

Overall	Mean	SD	Mean Difference	t-value	p-value
WhatsApp Group	21.08	2.258	0.48 + 3.210	0.936	0.355 NS. P>0.05
Information Booklet Group	20.60	1.985			
P<0.05 level *significant					

SECTION F
ASSOCIATION BETWEEN POST-TEST KNOWLEDGE SCORE REGARDING CARDIAC REHABILITATION AMONG CARDIOVASCULAR DISEASE PATIENTS WITH THEIR SELECTED DEMOGRAPHIC VARIABLE IN WHATSAPP GROUP.

Age in Years	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
25 – 35 Years	10	0	0	0	4	6	10.138 df=6 0.119 NS, P>0.05
36 – 45 Years	13	0	0	0	8	5	
46 – 55 Years	13	0	0	1	2	10	
56 and above	04	0	0	0	0	4	
S-Significant	NS- Non-Significant						df-degree of freedom
Religion	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Hindu	23	0	0	1	7	15	6.744 df=8 0.565 NS, P>0.05
Muslim	02	0	0	0	1	1	
Buddhist	06	0	0	0	3	3	
Christian	07	0	0	0	1	6	
Others	02	0	0	0	2	0	
S-Significant	NS- Non-Significant						df-degree of freedom
Gender	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Male	23	0	0	0	8	15	1.418 df=2
Female	17	0	0	1	6	10	
Other	00	0	0	0	0	0	
S-Significant	NS- Non-Significant						df-degree of freedom
Marital Status	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Married	26	0	0	1	9	16	3.524 df=6 0.741 NS, P>0.05
Unmarried	07	0	0	0	3	4	
Divorced	06	0	0	0	1	5	
Widow	01	0	0	0	1	0	
Other	00	0	0	0	0	0	
S-Significant	NS- Non -Significant						df-degree of freedom
Educational Qualification	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Primary Education	01	0	0	0	0	1	10.397 df=8 0.238 NS, P>0.05
Secondary Education	09	0	0	1	4	4	
Higher Secondary Education	12	0	0	0	1	11	
Graduation	08	0	0	0	4	4	
Post Graduation	10	0	0	0	5	5	
S-Significant	NS- Non-Significant						df-degree of freedom
Occupation	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Unemployed	08	0	0	1	3	4	14.832 df=8 0.062 NS,
Self-Employed	11	0	0	0	3	8	
Government	06	0	0	0	0	6	
Employee							P>0.05
Private Employee	12	0	0	0	8	4	
Retired	03	0	0	0	0	3	

S-Significant			NS- Non-Significant				df-degree of freedom
Family History of Heart Disease	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Yes	20	0	0	0	7	13	1.040 df=2 0.595 NS, P>0.05
No	20	0	0	1	7	12	
S-Significant			NS- Non-Significant				df-degree of freedom
Dietary Habit	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Vegetarian	09	0	0	0	5	4	6.259 df=4 0.181 NS, P>0.05
Non-Vegetarian	10	0	0	1	4	5	
Mixed Diet	21	0	0	0	5	16	
S-Significant			NS- Non-Significant				df-degree of freedom

SECTION G

ASSOCIATION BETWEEN POST-TEST KNOWLEDGE SCORE REGARDING CARDIAC REHABILITATION AMONG CARDIOVASCULAR DISEASE PATIENTS WITH THEIR SELECTED DEMOGRAPHIC VARIABLE IN INFORMATION BOOKELT GROUP

Age in Years	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
25 – 35 Years	08	0	0	0	3	5	1.409 df=3 0.703 NS, P>0.05
36 – 45 Years	08	0	0	0	4	4	
46 – 55 Years	15	0	0	0	5	10	
56 and above	09	0	0	0	5	4	
S-Significant			NS- Non-Significant				df-degree of freedom
Religion	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Hindu	14	0	0	0	7	7	1.580 df=4 0.812 NS, P>0.05
Muslim	03	0	0	0	1	2	
Buddhist	09	0	0	0	4	5	
Christian	08	0	0	0	2	6	
Others	06	0	0	0	3	3	
S-Significant			NS- Non-Significant				df-degree of freedom
Gender	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Male	29	0	0	0	12	17	0.054 df=1 0.816 NS, P>0.05
Female	11	0	0	0	5	6	
Other	00	0	0	0	0	0	
S-Significant			NS- Non-Significant				df-degree of freedom
Marital Status	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Married	24	0	0	0	11	13	3.115 df=3 0.374 NS, P>0.05
Unmarried	09	0	0	0	2	7	
Divorced	06	0	0	0	3	3	
Widow	01	0	0	0	1	0	
Other	00	0	0	0	0	0	
S-Significant			NS- Non-Significant				df-degree of freedom
Educational Qualification	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Primary Education	03	0	0	0	1	2	5.880 df=4 0.208 NS, P>0.05
Secondary Education	08	0	0	0	6	2	
Higher Secondary Education	07	0	0	0	3	4	
Graduation	15	0	0	0	6	9	
Post Graduation	07	0	0	0	1	6	

S- Significant		NS- Non-Significant					df-degree of freedom
Occupation	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Unemployed	07	0	0	0	5	2	5.612 df=4 0.230 NS, P>0.05
Self-Employed	12	0	0	0	6	6	
Government Employee	10	0	0	0	3	7	
Private Employee	08	0	0	0	3	5	
Retired	03	0	0	0	0	3	
S- Significant	NS- non-significant			t	df-degree of freedom		
Family History of Heart Disease	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Yes	21	0	0	0	9	12	0.002 df=1 0.962 NS, P>0.05
No	19	0	0	0	8	11	
S- Significant	NS- Non-Significant			t	df-degree of freedom		
Dietary Habit	No. of subjects	Poor	Average	Good	Very Good	Excellent	ϰ2-value p-value
Vegetarian	12	0	0	0	5	7	0.130 df=2 0.937 NS, P>0.05
Non-Vegetarian	03	0	0	0	1	2	
Mixed Diet	25	0	0	0	11	14	
S- Significant	NS- Non-Significant			t	df-degree of freedom		

V. CONCLUSION

In WhatsApp group the pre-test score is majority 47.5% of subjects had average level of knowledge score, 42.5% had poor level of knowledge score, 10% had good level of knowledge score and 0% had very good and excellent level of knowledge score. Mean knowledge score in pre-test of the subjects was 6.40 + 2.799. Minimum knowledge score in pre-test was 01 and Maximum Knowledge score in pre-test was 15. While in Post-Test, Majority 62.5% of subjects had excellent level of knowledge score, 35% had very good level of knowledge score, 2.5% had good level of knowledge score and 0% had poor and average level of knowledge score. Mean knowledge score in post-test of the subjects was 21.08 + 2. 258.Minimum knowledge score in post-test was 12 and Maximum Knowledge score in post-test was 25. In Information Booklet group the Pre-Test score is majority 75% of subjects had average level of knowledge score, 25% had poor level of knowledge score and 0% had good, very good and excellent level of knowledge score. Mean knowledge score in pre-test of the subjects was 6.83 + 2.218. Minimum knowledge score in pre-test was 01 and Maximum Knowledge score in pre-test was 10. While in Post-Test, Majority 57.5% of subjects had excellent level of knowledge score, 42.5% had very good level of knowledge score and 0% had poor, average and good level of knowledge score. Mean knowledge score in post-test of the subjects was 20.60 + 1.985. Minimum knowledge score in post-test was 17 and Maximum Knowledge score in post-test was 25. The overall mean WhatsApp group and information booklet group knowledge scores of subjects which reveals that post-test mean knowledge score of WhatsApp group was higher 21.08 with SD of ±2.258 when compared with mean post-test mean knowledge score of information booklet group was 20.60 with SD of ±1.985. The statistical Student's paired 't' test was applied at 5% level of significance. The tabulated value for n = 40-1 i.e. 39 Degree of freedom was 39 is that 2.021. The calculated value i.e. 0.936 was much lower than the tabulated value at 5% level of significance. For overall knowledge score of subjects which was statically not acceptable level of significance. Hence it was statistically interpreted that effectiveness of post-test knowledge score on WhatsApp group and information booklet group regarding cardiac rehabilitation among cardiovascular disease patients in selected hospitals of the city effective.

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