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A Study on Impact of Nutrition and Health Education through Conventional and Android based Application on Knowledge Attitude and Behaviour of the subject patients undergone cardiac procedures

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ABSTRACT

Digital technologies help in joining a long list of public-health innovations that have been at the heart of disease-prevention-and-containment strategies for centuries. At this time, there is an increase in people's awareness on health that has made new prospects in the field of healthcare and medicine that has warranted people around the world demanding quality health services.There is an increasing recognition that a personalized approach to nutritional modification may be more effective in helping people establish healthy eating patterns, combined with encouragement to exercise more, lead to the establishment of better lifestyle habits. CAD has a multi-factorial etiology, with many of the risk factors being influenced by lifestyle and food based approaches. So, this study has been undertaken to assess the impact of smartphone assisted nutritional counselling using an android-based application ("CANDe – Cardiac Awareness Nutrition & Diet Education") on Knowledge Attitude and Behaviour (KAB) and some relevant dietary habits of CAD patients who had undergone cardiac procedures in a Hospital of Indore City. Study enrolled one hundred seventy-six (eighty-eight in each group) patients admitted for cardiac procedures at the Apollo hospital, Indore, India. A non-biased investigator performed the randomization of the participants into the experimental and conventional group. All patients were voluntarily enrolled for the study. The allocation ratio for randomization was kept at 1:1 for equal distribution of patients into the groups. Under this study entails the use of conventional (Booklet) and digital (Android based app) method of NHEd (Nutritional and Health Education) interventions. Results showed a statistically significant change brought forth by the Android based NHEd intervention in all three aspects of KAB than Conventional method of NHEd intervention.

Key words: Knowledge, Awareness, Behavior, Nutritional counselling, CANDe – Cardiac Awareness, Nutrition & Diet Education

INTRODUCTION

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels, including coronary heart disease, cerebro-vascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism. India has one of the highest burdens of CVDs worldwide (**WHO, 2021**). The annual number of deaths from CVD in India is projected to rise from 2.26 million (1990) to 4.77 million (2020). The evolution of CVD is particularly more pronounce in urban regions but many vascular deaths also occur in rural regions of the country. Low level of physical activity and change in dietary patterns with westernization are emerging cause of CVD (**WHO, 2000**). Coronary heart disease (CHD) prevalence rates in India have been estimated over the past several decades and have ranged from 1.6% to 7.4% in rural populations and from 1% to 13.2% in urban populations (**Huffman DM et al, 2011**). The matter of serious concern is that CVD deaths of around 52% in India occur in people with age below 70 whereas equivalent is just 22% in developed countries (**Gupta and Gupta, 1996; Bahl 2001**.). Often CVD strikes in middle aged adults which pushes family into cycle of poverty as they lose their resource person to death or other disability (**Vidya P. and Bhooma N 2013,)** and families of bread earners poses economic challenges (**WHO-2011, Non communicable diseases country profile, Geneva**.).

Digital technologies help in joining a long list of public-health innovations that have been at the heart of disease-prevention-and-containment strategies for centuries. At this time, there is an increase in people's awareness on health that has made new prospects in the field of healthcare and medicine that has warranted people around the world demanding quality health services. Global and individual health goals have long been a new sustainable development agenda among many other universally agreeable developments for environmental, social and economic areas to be achieved before the turn of the new century. There is an increasing recognition that a personalized approach to nutritional modification may be more effective in helping people establish healthy eating patterns, combined with encouragement to exercise more, lead to the establishment of better lifestyle habits. Despite the proliferation of health-related apps and their apparent future in dietary interventions, there is currently limited evidence on the experience of using these self-monitoring tools, and how participants perceive the comparison between novel and traditional methods of dietary assessment.

Hence, the need of the hour is to develop and test a bilingually adapted, message reinforcing mobile application to educating patients with CAD's. The development of smartphone apps encompassing nutritional knowledge will make self- controlled learning and a repeated learning too possible at home and at work for CAD patients. The present research will be helpful to evaluate the impact of evidence-based diet and nutrition recommendations on clinical parameters and health behaviour among patients undergone cardiac procedures. The study will help to strategies future dietary modifications more effectively.

Thus, aim of the present research is to evaluate the impact of smartphone assisted nutritional counselling using an android based application ("CANDe – Cardiac Awareness, Nutrition & Diet Education") on the clinical health parameters, knowledge and awareness on health behaviour among patients undergone cardiac procedures.

Objective:
To assess the Impact of Nutrition and Health Education through conventional and Android based Application on health and Nutrition KAB of the subject patients undergone cardiac procedures.

METHODOLOGY

Sample of the study:
Population of study consisted of patients, admitted for cardiac procedures in a corporate hospital of Indore.It was then decided to consider the one hundred seventy-six (eighty-eight in each group) patients admitted for cardiac procedures at the Apollo hospital, Indore, India. A non-biased investigator performed the randomization of the participants into the experimental and conventional group. All patients were voluntarily enrolled for the study. The allocation ratio for randomization was kept at 1:1 for equal distribution of patients into the groups.

Under this study entails the use of conventional (Booklet) and digital (Android based app) method of NHEd (Nutritional and Health Education) interventions.

Development of Booklet:
A booklet entitling Cardiac Awareness, Nutrition and Diet Education was developed, using the scientific guidelines shared by various organizations involved in medical research, who educates consumers on healthy living and fosters appropriate cardiac care in an effort to reduce disability and deaths caused by cardiovascular disease and stroke.

Development of CANDe Mobile App:
The smartphone assisted nutritional counselling was provided by an Android based informative application named CANDe. Various Health and Nutrition aspects on knowledge and awareness and health behaviour was provided on the application along with tailored made push messages as a cues to be adhered.

Research Tools for Data Collection:
A structured general Pro forma in the study was used as the research tool to collect basic information of study population.As per the hospital policy a consent at admission was taken and they were asked to participate in the study on a voluntary basis to be part of this research study. Participant's basic and demographic information viz. name, age, sex, occupation, height, weight etc. was filled in this pro forma so to get the desired information. It took around 5-8 minutes for this task.

Survey styled google questionnaire was created in both English and Hindi, as a tool to assess the change in participant's knowledge and awareness at pre and post participation. Apart from the participants, identifiable information, this form comprised of three sections knowledge, behaviour and awareness related to diet, health, lifestyle, diabetes mellitus, hypertension, blood cholesterol levels, sugar, salt and fat in daily life.A non-biased investigator performed the randomization of the participants into the experimental and conventional group. The

allocation ratio for randomization was kept at 1:1 for equal distribution of patients into the groups. Under this study entails the use of conventional (Booklet) and digital (Android based app) method of NHEd (Nutritional and Health Education) interventions.

Post selection, participants were divided into two groups. One group was termed as experimental group, and the participants of this group were advised and guided to install the CANDe application on their personal android mobile phones from a link. The second group was termed as the conventional group and was provided with the booklet (printed format of CANDe app) which was entitled as "Cardiac Awareness, Nutrition and Diet Education".The deduction for knowledge were based on Low Medium and High scoring. The deduction for attitude were based on Unhealthy, Partially Healthy and Healthy scoring. The deduction for Behaviour were based on Unhealthy, Partially Healthy and Healthy scoring

RESULTS

A therapeutic nutrition may tame diseases like diabetes, cardiovascular diseases, and obesity and good nutrition can reduce the risk of developing chronic diseases such as heart disease. Several studies have investigated the impact of behaviour on food choice and consumption habits, and its positive impacts on the adoption of healthy eating habits. So, as per hypothesis: "The Impact of Nutrition and Health Education through Conventional and Android based Application on health and Nutrition KAB of the subject patients' undergone cardiac procedures shall not be different".

Table 1: Comparison Between Conventional and Android Based Application for Baseline and Final KAB Values of the Study Subject Patients

Health and Nutrition	Variable	Conventional Group			Experimental Group		
		Baseline	Final	Chi (Sig.)	Baseline	Final	Chi (Sig)
		%	%		%	%	
Knowledge	Low	5.68	2.27	1.44 (NS)	6.82	1.14	3.73
	Medium	38.64	40.91		32.95	34.09	
	High	55.68	56.82		60.23	64.77	
Attitude	Unhealthy	10.23	4.55	2.21	6.82	5.68	3.97
	Partially Healthy	35.23	38.64		44.32	30.68	
	Healthy	54.55	56.82		48.86	63.64	
Behaviour	Unhealthy	34.09	32.95	1.1 (NS)	32.95	9.09	42.5
	Partially Healthy	59.09	55.68		56.82	36.36	
	Healthy	6.82	11.36		10.23	54.55	

It is clear from the data that the distribution of subjects in different categories for Knowledge with regard to Low Medium and High in both Conventional and Experiment Group. The obtained chi value clearly indicates a statistically significant change brought forth by the Android based NHEd intervention in all three aspects of KAB than Conventional method of NHEd intervention as per respective Chi value, so the hypothesis is not accepted totally. The table further shows the response of the patients of both groups showed improvement in knowledge which improved from 55.68% to 56.82% in Conventional group, whereas improved from 60.23% to 64.77%, though it was significant in later group only.

Furthermore, it is clear that there was improvement in subject patients eating attitude in both the groups. Conventional group subject patients improved from 54.55% to 56.82% where as in Experimental group the subject patients improved from 48.86% to 63.64% in this regard. Moreover, similar improvement in subject patients eating behaviour in both the groups was observed. Conventional group subject patients improved negligibly from 6.82% to 11.36% where as in Experimental group the subject patients improved remarkably from 10.23% to 54.55% in this regard.

CONCLUSION

The obtained results clearly indicate a statistically significant change brought forth by the Android based NHEd intervention in all three aspects of KAB than Conventional method. the response of the patients of both groups showed improvement in knowledge which improved from 55.68% to 56.82% in Conventional group, whereas improved from 60.23% to 64.77%, though it was significant in later group only. Furthermore, it is clear that there was improvement in subject patients eating attitude in both the groups. Conventional group subject patients

improved from 54.55% to 56.82% where as in Experimental group the subject patients improved from 48.86% to 63.64% in this regard. Moreover, similar improvement in subject patients eating behaviour in both the groups was observed. Conventional group subject patients improved negligibly from 6.82% to 11.36% where as in Experimental group the subject patients improved remarkably from 10.23% to 54.55% in this regard. The Knowledge in Conventional group was at 80.57%, while in experimental group it was 77.43. The mean weight in Conventional group was significantly higher than experimental group.

To achieve better cardiovascular health, patients should elect an overall healthy dietary pattern that highlights the quality and the complete nutrition providing foods than anything which is not scientifically backed up. Building a strong evidence base high-quality observational and intervention studies is critical for effective policy changes, which can greatly improve the health of the individual.

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