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Evaluation of Nutrition Awareness of Rural Women Concerning Cardiovascular Disease

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ABSTRACT

Cardiovascular disease is the leading component of non-communicable diseases. Atherosclerotic and hypertensive diseases, mostly ischemic heart disease and stroke together with heart failure are the main Cardiovascular disease entities and signify threats to population health. In Pakistan, the incidence of Cardiovascular disease is more common among female as compared to male. The ratio of male to female patients is 1:3. Nutrition plays a significant role in the development and prevention of heart diseases. **Objective:** To evaluate of Nutrition Awareness of Rural Women Concerning Cardiovascular Disease. **Methods:** A descriptive cross-sectional study was carried out to assess the nutritional knowledge and health-related behaviour regarding cardiovascular disease of rural women aged 35 to 45. The research was a survey based with a well-established interview-based questionnaire was used to collect data. The sample was selected using random sampling and comprised of 300 respondents. **Results:** The results revealed rural women had little knowledge regarding good nutrition practices like consumption of high fat, low fiber, high amount of red meat, full-fat milk, and low amount of fruits and vegetables can lead to heart disease. **Conclusions:** It was concluded that assessment of nutritional knowledge regarding Cardiovascular disease of rural women age 35 to 45 gave statistical evidence of increasing risk factors for heart diseases. Results were useful in the development of gender-specific messages to increase awareness about heart disease and to promote lifestyle behaviours to decrease risk.

INTRODUCTION

Cardiovascular diseases are the leading cause of mortality and morbidity in developing countries. The term cardiovascular disease includes stroke, coronary heart disease, peripheral vascular disease and heart failure. Coronary heart disease (known as coronary artery disease or ischemic heart disease) is the most common form of heart-related disease and results from atherosclerosis or accumulation of fatty plaque in the artery walls that causes narrowing of the artery lumen [1]. Coronary artery disease which includes coronary syndrome, atherosclerosis, and other form of chronic ischemic disease, is responsible for many deaths. Cardiovascular disease (CVD) is the leading cause of morbidity and mortality especially in developing countries, despite advances in treatment and diagnostic procedures [2]. Knowledge about the risk factors of cardiovascular disease is considered to be important for adopting healthy lifestyle behaviours. One out of four deaths is because of cardiovascular disease [3]. Those who are not good in their behavioural factor have more chances of developing cardiovascular diseases. Underlying societal influences and socioeconomic parameters increase the chances of cardiovascular disease [4]. Socioeconomic status which is assessed by education, income level and occupation is directly related to diet quality. Socioeconomically disadvantaged people are associated with an increased prevalence of CVD mortality [5]. Atherosclerotic cardiovascular disease has a substantial impact on women's lives. Stroke and coronary heart disease, types of CVD, are responsible for the first and third causes of mortality in the world [6]. Among

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women, more deaths are because of CVD as compared to chronic lower respiratory disease, cancer, Alzheimer's disease and accidents. CVD is because by modifiable and non-modifiable factors. Gender, age and family history are non-modifiable factors. The risk of stroke and heart disease is decreased by as much as 80% by controlling cholesterol, smoking status, weight and hypertension. CVD modifiable risk factors are unhealthy diet, obesity, and sedentary lifestyle, harmful use of alcohol, stress and diabetes. The most vulnerable group to heart disease and stroke are people living in rural areas. In rural areas, major health-related issues are diabetes, tobacco use, obesity and low availability of doctors and hospitals [7]. Increased knowledge of the resident's CVD risk factors would be beneficial for public health-related programs and for the primary care provider and what would be the ways to increase health-promoting behaviors to decrease CVD risk factors [8]. Approximately 75% of risk factors are because of unhealthy lifestyle choices. Modification of risk factors focuses on three main lifestyle-related risk factors: diet/weight management, smoking cessation and physical activity. Women believe that osteoarthritis, arthritis and cancer are more common in women as compared to Coronary Artery Disease (CAD) whereas most of the deaths are because of heart diseases. Pakistanis 15.9% have a minimum of one factor of heart disease risk. Pakistani women have more heart disease risk factors than men [9]. The most common risk factors of heart disease in men are higher low-density lipoprotein (LDL) and cholesterol levels than in women. Common risk factors among women are high triglycerides and low high-density lipoprotein (HDL). The metabolic syndrome prevalence among Pakistani female was 49%. 30% of women who have metabolic syndrome are affected with CAD [10]. Coronary heart disease is the most common cause of death worldwide approximately it is the cause of 25–30 % of deaths. In Pakistan, a lack of knowledge about proper nutrition and risk factors for heart disease combined with a sedentary lifestyle and increased cigarette smoking are the major causes of heart disease.

Although cardiovascular disease is highly prevalent among Pakistani women, especially in rural populations, limited region-specific research has evaluated rural women's nutritional awareness and heart disease prevention knowledge in underserved communities. Existing studies largely focus on urban populations or general dietary risk factors, creating a gap in understanding the specific educational deficiencies among rural women. This study aims to find out the awareness of rural women about the diet and knowledge about the heart disease risk factors. The proposed study was about the assessment of nutritional knowledge and health behaviour regarding CVD of rural women aged 35 to 45 years.

METHODS

The research was conducted for the assessment of nutritional knowledge and health-related behaviours regarding CVD in rural women aged 35 to 45 and was based on a survey in a hospital so the data were collected through the questionnaire. The research design was descriptive cross-sectional, in which data were analyzed and collected from the population at a specific point in time. Study data were used to measure the prevalence of chronic and acute conditions in the population. The universe of this study was rural women. The period of data collection was of 6 months, form Jan 2024 to Jun 2024. The sample was collected from Ghurki Trust Teaching Hospital Jallo Morr, Lahore. The people visiting the hospital were coming from the various nearby villages and were selected conveniently to collect the data. Inclusion criteria included rural women between 35 to 45 years of age, visiting the Gurki Teaching Hospital. Those who had gone through a surgical operation up to 3 months earlier than the date of data collection were not included. Participants aged less than 35 and over 45 were excluded from the study. The sample size of this study was calculated by using standard formula [7] and 300 rural women were selected of 35-45 age. Informed consent was taken. The non-probability convenience sampling technique was used in this study. A questionnaire was used to assess the nutritional knowledge related to cardiovascular disease in rural women. The demographic section consists of the following variables name, age, residence, education, income, marital status and occupation. The second section contains questions about the nutritional knowledge of rural women. This section consists of questions regarding fiber, fat, vegetables, fruits, meat, weight and fatty foods. The questionnaire was administered to rural women after obtaining permission from college authorities. The researcher selected a hospital located in the village, Ghurki Trust Teaching Hospital, Jallo Morr and after acquiring formal permission from the hospital the researcher collected data from the rural women. The questionnaire used for data collection was self-administered by the researcher. The personal information of respondents was kept confidential. They were given 15 minutes to answer questions. The queries about any questions were explained in detail. The three months' duration was required by the researcher to collect data and multiple visits were held. For the present study, the data were analyzed by SPSS software (Statistical Package for the Social Sciences); Version 23.0 and Microsoft Excel 2010. The data were presented in the form of frequencies and percentages by using tables and bar charts.

RESULTS

The present study was intended to assess nutrition knowledge and health behaviours regarding cardiovascular

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disease of rural women aged 35-45 years. The data of this study has been presented using descriptive analysis of the demographic information that was collected in the first section of the questionnaire. The heart disease-related nutrition knowledge of the respondents is statistically analyzed in the form of percentages and frequencies by using bar charts and tables. The demographic section includes age of the respondent, education, marital status, and occupation. The nutritional knowledge section includes the following sections: fiber, fat, weight, fruits and vegetables, meat, fatty food and salt. 51% of rural women were in the range of 40-45 of age. 54.5% of rural women were illiterate. 68% of women had an income of less than 10,000. 65.4% of women were married. 52.6% of women were unemployed (Table 1).

Table 1: Demographics of the Respondents

Characteristics	n (%)
Age	
30-34	56 (18%)
35-39	86 (27.6%)
40-45	158 (51%)
Education	
Less than Matric	58 (16.8%)
Matric	31 (9.9%)
Intermediate	22 (7.1%)
BS	14 (4.5%)
Higher	5 (1.6%)
None	170 (54.5%)
Income	
less Than Rs. 10,000	212 (67.9%)
Rs. 11000-30000	64 (20.5%)
Rs. 31000-50000	23 (7.4%)
Rs. 51000 above	1 (0.3%)
Marital Status	
Married	204 (65.4%)
Widow	52 (16.7%)
Divorced	30 (9.6%)
Unmarried	14 (4.5%)
Occupation	
Unemployed	164 (52.6%)
Self-Employed	10 (3.2%)
Employed By the Government	29 (9.3%)
Employed By Individual	97 (31.1%)

The nutritional knowledge questionnaire is further divided into parts which include fiber, fat, weight, fruits and vegetables, meat, salt and fatty food consumption. Results show that 44% of rural women did not know the role of fibre in decreasing the chances of risk factors for heart disease. 41% disagree that major health diseases are related to low consumption of fibre. 46% agree that white flour is better for health than brown flour. 57% disagree that brown bread is good for heart health (Table 2).

Table 2: Fiber Related Knowledge

Questions	n (%)
Increasing the fiber in your diet reduces the chances of heart disease	
Strongly Disagree	28 (9.0%)
Disagree	41 (13.1%)
Neutral	137 (43.9%)
Agree	73 (23.4%)
Strongly Agree	21 (6.7%)
Major health diseases are related to low consumption of fiber	
Strongly Disagree	34 (10.9%)
Disagree	128 (41%)
Neutral	87 (27.9%)
Agree	41 (13.7%)
Strongly Agree	10 (3.2%)
White flour is better for health than brown flour	
Strongly Disagree	12 (38%)
Disagree	46 (14.7%)
Neutral	79 (25.3%)
Agree	143 (45.8%)
Strongly Agree	20 (6.4%)
Brown bread is good for heart health	
Strongly Disagree	14 (4.5%)
Disagree	177 (56.7%)
Neutral	71 (22.8%)
Agree	26 (8.3%)
Strongly Agree	12 (3.0%)

The finding shows that 43% are not aware that reducing the fat in your diet decreases the chances of heart disease. 53% of rural women were neutral that margarine contains less fat as compared to butter. 50% disagree that vegetable oil is better than ghee (Table 3).

Table 3: Fat Related Knowledge

Questions	n (%)
Reducing the fat in your diet decreases the chances of heart disease	
Strongly Disagree	11 (3.5%)
Disagree	62 (19.9%)
Neutral	132 (42.3%)
Agree	86 (27.6%)
Strongly Agree	9 (2.9%)
Margarine contains less fat as compared to butter	
Strongly Disagree	26 (8.3%)
Disagree	42 (13.5%)
Neutral	164 (52.6%)
Agree	61 (19.6%)
Strongly Agree	7 (2.2%)
Vegetable oil is better than ghee	
Strongly Disagree	8 (2.6%)
Disagree	155 (49.7%)
Neutral	101 (32.4%)
Agree	24 (7.7%)
Strongly Agree	12 (3.8%)

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Results show that 59% disagreed that overeating is the main cause of obesity. 34% agreed that reducing food intake is helpful in reducing body fat. 33% disagreed that being overweight is one of the main causes of heart disease. 52% gave a neutral answer to the question that is the brown sugar better than white sugar. This means they do not know about it (Table 4).

Table 4: Weight-Related Knowledge

Questions	n (%)
Overeating is the main cause of obesity	
Strongly Disagree	21 (6.7%)
Disagree	183 (58.7%)
Neutral	46 (14.7%)
Agree	42 (13.5%)
Strongly Agree	8 (2.6%)
Reducing food intake helps reduce body fat	
Strongly Disagree	41 (13.1%)
Disagree	56 (34%)
Neutral	75 (24%)
Agree	106 (17.9%)
Strongly Agree	22 (7.1%)
Being overweight is one of the main causes of heart disease	
Strongly Disagree	27 (8.7%)
Disagree	102 (32.7%)
Neutral	95 (30.4%)
Agree	63 (20.2%)
Strongly Agree	1 (0.3%)
Brown sugar is better than white sugar	
Strongly Disagree	29 (9.3%)
Disagree	37 (11.9%)
Neutral	163 (52.2%)
Agree	69 (22.1%)
Strongly Agree	2 (0.6%)

41% agreed that eating less than 2 servings of fruits is good for health. 44% disagreed that eating more vegetables helps reduce heart disease. 51% strongly disagreed that eating a minimum of 5 servings of fruits and vegetables per day can lower your blood pressure. 39.1% disagreed that Almonds are good for heart health (Table 5).

Table 5: Fruits and Vegetables Related Knowledge

Questions	n (%)
Eating less than 2 servings of fruits is good for health	
Strongly Disagree	27 (8.7%)
Disagree	58 (18.6%)
Neutral	69 (22.1%)
Agree	128 (41%)
Strongly Agree	18 (5.8%)
Eating more vegetables helps reduce heart disease	
Strongly Disagree	9 (2.9%)
Disagree	137 (43.9%)
Neutral	55 (17.6%)
Agree	86 (27.6%)
Strongly Agree	13 (4.2%)
Eating a minimum of 5 servings of fruits and vegetables per day can lower your blood pressure	
Strongly Disagree	159 (51%)
Disagree	28 (9%)
Neutral	73 (23.4%)
Agree	32 (10.3%)
Strongly Agree	8 (2.6%)
Almonds are good for heart health	
Strongly Disagree	29 (9.3%)
Disagree	122 (39.1%)
Neutral	85 (27.2%)
Agree	61 (19.7%)
Strongly Agree	3 (1%)

Finding show 35% disagreed that eating too much meat is not good for health. 45% agreed that Red meat is better for health than chicken. 39% disagreed that Fish is good for heart health. 32% strongly disagreed that Egg yolk contain more fat as compared to egg white (Table 6).

Table 6: Meat Related Knowledge

Questions	n (%)
Eating too much meat is not good for health	
Strongly Disagree	61 (19.6%)
Disagree	108 (34.6%)
Neutral	66 (21.2%)
Agree	52 (16.7%)
Strongly Agree	13 (4.2%)
Red meat is better for health than chicken	
Strongly Disagree	23 (7.4%)
Disagree	29 (9.3%)
Neutral	104 (33.3%)
Agree	114 (45.2%)
Strongly Agree	3 (1%)
Egg yolk contains more fat as compared to egg white	
Strongly Disagree	99 (31.7%)
Disagree	51 (16.3%)
Neutral	94 (30.1%)
Agree	52 (16.7%)
Strongly Agree	4 (1.3%)
Fish is good for heart health	
Strongly Disagree	37 (11.9%)
Disagree	122 (39.1%)
Neutral	77 (24.7%)
Agree	56 (17.9%)
Strongly Agree	8 (2.6%)

This shows that 45% did not have any knowledge that eating fatty foods does not affect blood cholesterol levels. 49% disagreed that steamed chicken is better than red meat. 39% agreed that fried foods are better for heart health (Figure 1).

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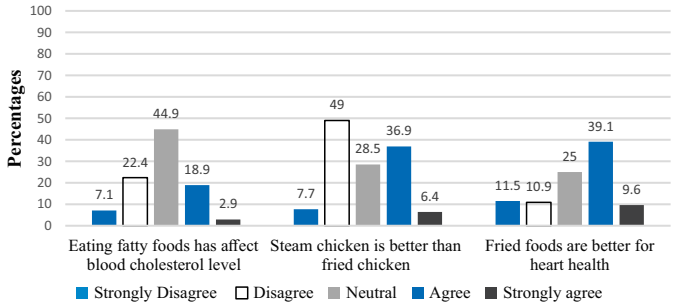

Figure 1: Graphical Representation of Rural Women's Perception Regarding Fatty Food Consumption

This shows that 38% disagreed that eating too much salt is not good for health. 46.2% disagreed that less salt is good for controlling blood pressure. 54% did not know that processed foods contain more salts than non-processed food(Figure 2).

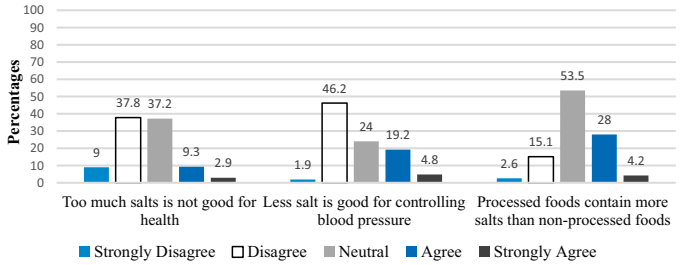

Figure 2: Graphical Representation of Rural S Perception Regarding the Salt

DISCUSSION

The study mainly aimed to assess the nutritional knowledge of rural women regarding CVD. Heart disease-related nutrition knowledge is precise and significant for behaviour change. Improper nutrition and unhealthy dietary habits are the leading causes of heart disease among rural women [11]. This study would be helpful in the development of a nutrition education plan about CVD. Awareness regarding CVD risk factors and nutrition play a significant part in healthy heart-associated actions of women [4]. The diet plays a noteworthy part in preventing and developing heart disease. There is a direct connection between CVD and unhealthy dietary patterns [12]. The proper knowledge about the nutrition is essential for the upgrading of lifestyle that averts heart diseases. High intake of saturated fat, Trans fat, cholesterol and sodium can lead to heart disease. Low intake of fruits, vegetables and whole grains increases the risk factors for heart disease [13]. Results showed that the knowledge of rural women regarding fiber intake is inadequate. Four questions were asked about the fiber intake of rural women they had negative Responses. 44% of rural women did not know the role of fiber in decreasing the chances of risk factors for heart disease. 41% of women disagree that major health diseases are related to low consumption of fiber. 46% of women think that white flour is better than brown flour. 57% strongly disagree that brown bread is good for heart health. This finding shows that they do not know the benefits of fiber. These findings are similar to the study that concludes that less intake of fiber is one of the causes of heart disease. In the end, it was concluded that the predominant diet and lifestyle patterns in the study are related with excessive intake of saturated fats and cholesterol associated with cardio-metabolic disease. The Fruits, nuts, Vegetables, and Legumes pattern related to the component proline betaine has been associated with reduced risk. The Animal Protein intake pattern was related to ceramides, NAPEs, sphingomyelins, and short-chain acylcarnitines. Moreover, Animal Protein and sweets, Fried Snacks, and High-Fat Dairy patterns had contrary associations with omega-3 fatty acids, which have been associated with a lesser risk of cardiovascular disease. [14]. High intake of fat is one of the reasons for heart disease particularly saturated fat which mostly comes from animal sources. Results depicted the knowledge of rural women about fat intake. 50% of women disagree that vegetable oil is better than ghee. 44.2 % agree that high-fat food prevents the chances of heart disease. 53% of rural women were neutral that margarine contains less fat as compared to butter. 43% are not aware that reducing the fat in your diet decreases the chances of heart disease. These findings show that rural women are unaware of the connection between fat intake and cardiovascular disease. These findings are in line with the comparable study which accomplishes that rural women do not have healthy dietary habits. The respondent's fat consumption is greater because they have less knowledge about heart disease and the role of nutrition in its development. The results concluded that Diet is a risk factor for coronary artery disease and can be attuned to decrease the risk. Consumption of beef, chicken, eggs and junk food is related to a high threat of CVD. Ingestion of vegetables, yoghurt, and fruits, on the other hand, has a protective effect against coronary artery disease. Anthropometric methods such as BMI, WHR and WC can also show an augmented risk of coronary artery disease [15]. High fat can lead to atherosclerosis, particularly saturated fat. Saturated fat is typically present in whole milk, cheese and yoghurt. Results characterized that 46.2% had given a neutral response to the question that is more calcium in whole milk than skimmed milk. 46.2% agreed that full-fat yoghurt is better for health than low-fat yoghurt. 53% agreed that a glass of whole milk is better than skimmed milk. These results verdicts are in line with another study which exhibited that saturated fat is one of the main causative factors of heart problems. Total dietary fiber intake was linked with a lesser long-term CVD risk, particularly in the 20–39 and 40–59 age groups, where the decrease was most

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momentous [16]. Overweight is the leading cause of heart disease. Results exhibited the knowledge of rural women about overweight is insignificant. 33% of women consider that overweight is not the cause of heart disease. 59% disagree that overeating can cause obesity. 34% agreed that reducing food intake helps reduce body fat. 52% gave a neutral answer to the question that is the brown sugar better than white sugar. This means they do not know about it. Rural women do not consider the overweight as a risk factor for heart disease. Another study also got similar results. Among the participants, half of the patients had awareness concerning heart-healthy choices, 37% were consuming a healthy diet, 50% were partially following and 4.4% were not taking at all. It concluded that the awareness of participants regarding healthy diet and lifestyle was insufficient and also their dietary practices were of inferior quality and not in harmony with the medical references. There is an essential requirement to increase awareness in heart patients concerning healthy diet selections so that their risk of CVD progression can be reduced [17]. Increased intake of fruits and vegetables is important for the prevention of heart disease. Findings indicated the knowledge of rural women about fruits and vegetables about heart disease [18]. 41% agree that eating less than two servings of fruits is good for health this means their dietary habits are not good as they have insufficient knowledge. 44% disagree that eating more vegetables helps reduce heart disease. 51% strongly disagree that eating a minimum of 5 servings of fruits and vegetables per day can lower your blood pressure. 39.1% disagree that Almonds are good for heart health. Another comparable study has similar results that the knowledge about fruits and vegetables about heart disease in rural women is insufficient [19]. Salt increases the blood pressure of the body which is the risk factor of heart disease. Results illustrated that 38% disagree that eating salt is not harmful which means they do not know the damaging effects of high consumption of salt on health. 46.2% disagreed that less salt is good for controlling blood pressure. 54% did not know that processed foods contain more salts than non-processed foods. Another study presented that rural women consume high amounts of salt and they have no knowledge regarding the bad effects of salt on health [20]. High meat consumption increases the risk factors for heart disease. Animal sources contain saturated fat which increases the lipid profile of blood. Results disclosed the knowledge of rural women regarding the meat group. 35% agreed that eating red meat is good for health. 39% disagreed that fish is good for the health of the heart. 32% strongly disagreed that Egg yolk contains more fat as compared to egg white. All of these findings showed rural women have inadequate knowledge regarding meat groups which is the main reason for obesity and heart disease among them [21]. Increased consumption of fatty foods increases the fat consumption of people. Mostly saturated and Trans fat leads to heart disease. 45% did not have any knowledge that eating fatty foods does not affect blood cholesterol levels. 49% disagreed that steamed chicken is better than red meat. 39% agreed that fried foods are better for heart health. These findings indicated that participants did not know fatty foods and their role in the development of heart disease. In another study results depicted that Conferring to the BMI, the maximum number of the respondents were overweight. The respondents' practice level of healthy diet and lifestyle was lower than their knowledge and attitude level toward CAD. A positive correlation originated among the respondents' attitude, knowledge and practice [22]. Most of the CVD patient's BP levels and troponin values were estimated higher than the standard limit. Along with that lipid profile level was higher than the normal value. Most of the participants were in borderline risk condition of CVD and some had great risk. The patients who consumed a higher amount of egg, red meat, cheese, soft drinks, fast food, and snacks had increased LDL and TG levels in blood which were the main risk factors of CVD than the patients who take fish, pulse, chicken, nuts, vegetables, and fruits in their diet habitually. the research thus concluded that the majority of participants were not aware of nutrition knowledge regarding heart health. The lack of awareness has affected their health-related behaviour adversely. They are ignorant about the foods that increase their risk of CVD. The proper nutrition education intervention must be conducted in rural areas [23]. They must be made aware of the bad aspects of the consumption of high amounts of fatty foods [24]. Seminars and workshops should be held in rural areas regarding healthy dietary habits and health behaviours for the prevention of CVD. Media should play a pivotal role in the provision of nutritional knowledge regarding heart health and the promotion of healthy lifestyle behaviours.

The study was limited by its cross-sectional design, convenience sampling from a single hospital, and reliance on self-reported questionnaire responses, which may reduce generalizability and introduce selection or response bias. Additionally, the absence of validated scoring systems for knowledge assessment may affect measurement precision. Future studies should use larger multicenter samples, validated assessment tools, and longitudinal or interventional designs to evaluate the effectiveness of nutrition education programs in improving cardiovascular awareness and preventive behaviors among rural women.

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CONCLUSIONS

It was concluded that the majority of rural women are not aware of nutrition knowledge regarding heart health. The lack of awareness has affected their health related behavior adversely. They are ignorant about the foods that increases the risk of heart disease. The proper nutrition education intervention must be conducted in the rural areas. They must be made aware about the bad aspect of consumption of high amount of fatty foods. Seminars workshops should be held in rural areas regarding healthy dietary habits and health behaviors for the prevention of CVD. Media should play pivotal role in in provision of nutritional knowledge regarding heart health and in the promotion of healthy lifestyle behaviors.

Authors' Contribution

Conceptualization: AS
Methodology: AS
Formal analysis: MNK
Writing and Drafting: SS
Review and Editing: SS, MNK, AS

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

All the authors declare no conflict of interest.

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