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Original Article**Knowledge of dietary habit and behavior-related determinants of non-communicable disease in women of urban setting of Eastern Nepal**

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Received: 4th February, 2018; Revised after peer-review: 22th March, 2018; Accepted: 14th April, 2018DOI: <https://doi.org/10.3126/jonmc.v7i2.22264>**Abstract:****Background**

The non-communicable diseases (NCDs) are one of the leading causes of death globally which accounts for 68% out of world's 56 million deaths in 2012. Around 82% of the premature deaths due to NCDs occur in the low-and middle-income countries and 40% of global NCD-related deaths take place before the age of 70. The study aimed to assess knowledge of dietary habits and behaviour-related determinants of NCD in urban Nepalese women of Eastern Nepal.

Materials & methods

A cross-sectional study was designed by using interviewer-administered questionnaire regarding knowledge on NCD. The definitions used for the study adopted the WHO STEP wise approach to chronic disease risk factor surveillance (STEPS) survey. A total 706 women aged 20–59 years were selected randomly from Inaruwa Municipality of Eastern Nepal.

Results

The overall knowledge scores was found to be 62.14% with standard deviation 14.93% and it build up that the diet- and behaviour-related causes (mean score 75.25%), diet quality (mean score 45.27%) fruit and vegetable link (mean score 30.02%), health consequences of obesity (mean score 76.82%), causes of cardiovascular disease (mean score 77.08%) and causes of certain cancers (mean score 36.10%) were calculated. The total score of knowledge regarding NCD was found to be significant with caste/ethnicity, education level, occupation, socioeconomic status, physical activity and fruit intake.

Conclusions

Findings revealed the population had good overall knowledge concerning diet and nutrition related to NCD in the relatively new context of the obesity epidemic in urban set up of Nepal. However, there was poor knowledge of the benefit of eating fruit and vegetables and other preventable causes of certain cancers. Nutrition education messages need to be communicated within the general population of women. Education targeting the benefits of vegetables and fruit may have the positive impact on NCD prevention.

Key words: *Hypertension, Prevalence, Socio-demographic factors*

Introduction

The non-communicable diseases (NCDs) are one of the leading causes of death globally which accounts for 68% out of

world's 56 million deaths in 2012. Around 82% of the premature deaths due to NCDs occur in the low-and middle-income countries and 40% of global NCD-related

deaths take place before the age of 70[1]. Non-communicable diseases, also known as chronic diseases, are not passed from person to person. They are of long duration and generally of slow progression [2]. WHO identifies cardiovascular diseases, cancers, diabetes and chronic lung diseases as the main four leading Non-communicable disease. The burden of NCDs is rising along with the communicable and re-emerging diseases in the low- and middle-income countries.

According to the Steps Survey done in Nepal, Nepal is also facing triple burden of diseases, namely communicable diseases, re-emerging diseases and non-communicable diseases. Rising trend of NCD prevalence has led to the estimated death of 60% of total deaths. For the age group between ages 30 and 70 years, the probability of dying from the four leading NCDs is 22% [3], [4].

There are different modifiable and non-modifiable risk factors viz. Age, Sex, Genetic factors, Ethnicity, Obesity, Higher salt intake, High saturated fatty acids food intake, low dietary foods, Alcohol, Lower physical activity and sedentary life style and Others environmental factors [5]. Most of the premature deaths caused by these NCDs are linked by common preventable risk factors related to lifestyle such as tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol [6]. Exposure and vulnerability to these risk factors is being driven by rapid urbanization, economic development and market globalization [7]. The knowledge of the diseases and its risk factors among the individuals itself affects the disease pattern in the community.

Prevention and control of such preventable diseases should be done by the intervention at the family and community level.

People with the increased sedentary life style are also prone to consumption of

energy dense food that contains high sugar, fat and salt. Educating the people regarding the benefits of increased vegetables and fruit intake as well as physical activity is necessary. At the same time, implementation of such strategy by the government is important which has been recommended by World Health Organization (WHO) Global Strategy on Diet, Physical Activity and Health.

The social and economic development is severely affected by the global burden of non-communicable disease and it is the major threat to public health at present. The morbidity due to the chronic disease has posed a threat to the countries and this has caused a big impact in the low-and middle-income countries. The morbidity and mortality from non-communicable diseases mainly occur in adulthood but the exposure to risk factors begins in early life. Children can die from treatable non-communicable diseases (such as rheumatic heart disease, type 1 diabetes, asthma and leukemia) and health promotion, disease prevention and comprehensive care are important steps to avoid it. According to WHO, the total annual number of deaths from non-communicable diseases will increase to 55 million by 2030 if "business as usual" continues.

Scientific knowledge demonstrates that the non-communicable disease burden can be greatly reduced if cost-effective preventive and curative actions, along with interventions for prevention and control of non-communicable diseases already available, are implemented in an effective and balanced manner [8]. In many low and middle-income countries, the low socio-economic, legal and political status of girls and women is increasing their exposure and vulnerability to the risk factors of NCDs [7]. The knowledge of the risk factor and its effect on health if known by the individual can prevent the disease and its consequences.

The increasing trend in the prevalence of the non-communicable diseases can be decreased only with the prevention of the risk factors and this can be achieved with the healthy lifestyle. The knowledge of the disease and its behaviors, diet and physical activity plays an important role in achieving the healthy life and this can be done through community health promotion [9]. The scenario is similar in Nepal like the other developing countries where the morbidity and mortality due to non-communicable disease is high. NCDs risk factors are highly prevalent among the Nepalese population, which is a serious public health problem. Unless urgent and targeted interventions are made to prevent, treat and control non communicable diseases and their risk factors, the burden of NCDs could become unbearable in Nepal [4]. The community based studies on knowledge of the diet and behavior are few in Eastern Nepal. The prevalence of the knowledge regarding the non-communicable disease and its risk factors like diet and behavior if known can help plan the approach method to bring changes in the community. The objectives of this study were, to assess the knowledge of dietary and behavior-related determinants of NCD and identify gaps in knowledge that could be the target for future public health nutrition programs.

Methodology

This was a community based descriptive study to find out the knowledge of dietary and behavior related determinants of non-communicable disease in women of urban setting of eastern Nepal. This study was carried out from March 2015 to February 2016. Women, those who prepare food at their homes in the Inaruwa Municipality of Eastern Nepal were included in this study. Out of 10 wards of Inaruwa municipality, 4 wards (ward no. 2, 7, 8, 9) were selected randomly by lottery method. The

population proportionate sampling was done to collect the number of sample of each ward. A total 706 women were interviewed between the age group of 20 – 60 years. The definitions used for the study adopted the WHO STEP wise approach to chronic disease risk factor surveillance (STEPS) survey [23]. The ethical approval was taken from institutional review committee of BPKIHS.

For the socioeconomic status, modification of Kuppuswamy's Socioeconomic Status Scale in context to Nepal [24] was used and the ethnic groups were classified according to the National Central Bureau of Statistics of Nepal [25].

- a) Current drinkers: respondents who consumed alcohol in the previous 30 days.
- b) One serving of vegetable: one cup of raw, leafy green vegetables (spinach, salad, etc.), one half cup of other vegetables, cooked or raw (tomatoes, pumpkin, beans etc.), or half cup of vegetable juice;
- c) One serving of fruit: one medium-sized piece of fruit (banana, apple, etc.) or half cup of raw, cooked or canned fruit, or a half cup of juice from a fruit (not artificially flavored).
- d) Physical activity: it included questions on number of days and time spent on vigorous and/or moderate activities at work; travel to and from places, and recreational activities. The responses were converted to MET minutes/week. The respondents were labeled as having vigorous activity or moderate activity if they achieved certain MET minutes as given in the WHO steps manual. If s/he did not fulfill the criteria of having vigorous or moderate activity Low physical activity were considered.
- e) Tobacco use: Current smokers were the ones who smoke daily. The average pack year was calculated. Ex-

smokers were the ones who have not been smoking for the past 1 year.

Data Collection Tools and Techniques:

Data collection was carried out at community of Inaruwa Municipality. A validated standard questionnaire developed by Michelle Holds worth, Francis Delpeuch et al in their study done in Senegal was used and face to face interview was done systematically.²⁶ The questionnaire was pretested after it was translated into the local language (or Nepali) and the linguistic validity was done by back translation.

The reliability of each set of items in the pretested questionnaire in measuring each item-to-item correlation is Cronbach's α of 0.703 and for each domain from our study indicated that items-to-items correlation is >0.2 with Cronbach's α of 0.926.

Modification of Kuppuswamy's Socioeconomic Status Scale in context to Nepal was used to assess the socioeconomic status of the community [24].

Data entry and analysis

All interviewed questionnaires were indexed and kept on file. Data was entered in Microsoft Excel 2007 and converted into SPSS (statistical package for social science) 11.5 version for statistical analysis. For descriptive statistics, percentage, proportion, mean and standard deviation were calculated. For inferential statistics, χ^2 test was applied to find out the significant difference between knowledge of dietary and behavioral-related determinants of NCD in women of urban setting of Eastern Nepal and socio-demographic characteristics at 95% confidence interval where $p = 0.05$.

Results

All the participants were willing to participate. Out of 706 participants, majority of the responders belonged to age group of 30-39 years (34%) and the mean age in years is 35.42 years. Approximately

94.3% of the responders were married. The sample population comprised 97.5% of Hindu women and 50.6% of the responders belonged to the ethnic group Madhesi followed by Brahman/Chhetri (25.4%), Out of total 34.8% women were illiterate. Majority of them were house wives (51.7%).

Among total participants 25.6% of head of household had received high school education. Out of 706 households, 258 (36.5%) of the head of household were found to be involved in one of the three occupation namely clerical, shop-owner, farmer. Approximately, 28.6% of the family had income in the range of NRs 11451 – 17150 per month. Socio economic status of upper and middle upper middle class comprised 39.1% of the total households. Of the total women interviewed, 98.2% of them never smoked and none of them were alcoholic, similarly, 46.3% of them did moderate physical activity. When asked about the vegetable and fruit intake habit, 58.5% were taking one half cup of vegetable in cooked or raw form while 80.5% of people were observed to be taking half cup of raw, cooked or canned fruit during our study.

The scores developed suggest that knowledge of dietary and behavior related determinants of non-communicable disease was not associated with age, religion, tobacco smoking, vegetable intake ($p=0.991$) while caste/ethnicity, education, occupation, socioeconomic status, physical activity and fruit intake were found to be significantly (p -value <0.05) influencing the knowledge of dietary and behavior related determinants of non-communicable disease of women.

Our study showed Brahman/Chhetri to have more knowledge of dietary and behavior related determinants of non-communicable diseases compared to other groups suggesting that there is significant

association ($p < 0.001$) between caste/ethnicity and knowledge. There is significant association ($p < 0.001$) between education and knowledge highlighting to the fact that those women who have got higher education know more about the dietary and behavior related determinants of non-communicable diseases.

Women involved in occupation (such as profession/semi profession) are more

knowledgeable than those who are unskilled or unemployed which suggests that there is a distinct relation ($p < 0.001$) between occupation and knowledge. Likewise, the socioeconomic status (Table no. 2) suggests that higher the class of living, higher is the standard of knowledge among the responders ($p < 0.001$).

Table 1: Knowledge of the dietary and behavioral-related risk factors of the participants (n = 706)

Questions	Yes	No	Don't Know
1 Eating a lot of fat can contribute to heart problems	635(89.9%)	35(5%)	36(5.1%)
2 Eating a lot of fat can contribute to obesity	496(70.3%)	174(24.6%)	36(5.4%)
3 Eating a lot of fat can contribute to certain cancer	339(48%)	72(10.2%)	295(41.8%)
4 Eating a lot of sugar can contribute to heart problems	474(67.15%)	95(13.5%)	137(19.4%)
5 Eating a lot of sugar can contribute to obesity	359(50.8%)	252(35.7%)	95(13.5%)
6 Eating a lot of salt can contribute to heart problems	510(72.2%)	90(12.7%)	106(15%)
7 Eating a lot of salt can contribute to certain cancers	184(26.1%)	143(23.3%)	379(53.7%)
8 Low intake of fruit can contribute to heart problems	400(56.7%)	173(24.5%)	133(18.85%)
9 Low intake of fruit can contribute to obesity	122(17.3%)	494(70%)	90(12.7%)
10 Low intake of fruit can contribute to certain cancers	173(24.5%)	181(25.6%)	352(49.9%)
11 Low intake of vegetables can contribute to heart problems	414(58.6%)	181(25.6%)	111(15.7%)
12 Low intake of vegetables can contribute to obesity	126(17.8%)	498(70.5%)	82(11.6%)
13 Low intake of vegetables can contribute to certain cancers	164(23.2%)	176(24.9%)	366(51.8%)
14 Eating too much food can contribute to obesity	604(85.6%)	85(12%)	17(2.4%)
15 Obesity increases the risk of developing diabetes	653(92.5%)	20(2.8%)	33(4.7%)
16 Obesity increases risk of breast cancer after the menopause	329(46.6%)	33(4.7%)	344(48.7%)
17 Obesity increases the risk of developing bowel cancer	340(48.2%)	43(6.1%)	323(45.8%)
18 Obesity increases risk of developing hypertension	639(90.5%)	32(4.5%)	35(5%)
19 Weight increase gradually increases risk of heart problems	655(92.8%)	11(1.6%)	40(5.7%)
20 Lack of physical activity can contribute to obesity	653(92.5%)	43(6.1%)	10(1.4%)
21 Lack of physical activity can contribute to heart problems	600(85.0%)	58(8.2%)	48(6.8%)
22 Obesity can contribute to heart problems	630(90.4%)	20(2.8%)	48(6.8%)
23 High blood cholesterol can contribute to heart problems	580(82.2%)	13(1.8%)	113(16%)
24 Smoking can contribute to heart disease	684(96.9%)	9(1.3%)	13(1.8%)
On an average total	449(63.52)	122(17.29)	135(19.13)

The analysis done relating the physical exercise and knowledge showed a significant association ($p = 0.002$)

illustrating those performing exercise have a better knowledge regarding determinants of non-communicable disease. Those

taking fruits regularly also showed a promising knowledge regarding the dietary and behavior related determinants of non-communicable disease with a very significant association ($p < 0.001$). Although the participants consuming vegetables is appreciable but their association with knowledge is quite insignificant.

Discussion

NCDs can refer to chronic diseases which last for long periods of time and progress slowly. The different non-modifiable risk factors are age, sex, genetic factors and ethnicity and the modifiable risk factors are obesity, higher salt intake, low dietary foods, alcohol, lower physical activity and sedentary life style. Evidences demonstrate that it is possible to prevent NCDs in the family and community if women have proper knowledge about risk factors of NCDs [1].

This study was carried out to find out knowledge of dietary and behavior related determinants of NCDs in women of urban setting of Eastern Nepal.

According to American journal of health research, in a study of assessment of knowledge of Nigerian female undergraduates on obesity as a risk factor for cardiovascular disease in women, less than half of the female undergraduates at a Nigerian university community had good knowledge of obesity as a risk factor for cardiovascular disease in women [15]. While 51.1 % of the responders of the same age group from our study considered obesity as a risk factor of cardiovascular diseases.

According to cross-sectional, population study done on "Knowledge of dietary and behavior-related determinants of non-communicable disease in urban Senegalese women", subjects scored least for their knowledge of the protective effect of fruit and vegetables (mean score of 19.9%)

knowledge of causes of certain cancers (mean score of 36.1%) was also low [10]. According to our research, the knowledge that low intake of vegetables can contribute to cardiovascular diseases was found to be insignificant (p value=0.991) whereas the knowledge about impact of fruit intake over the causation of CVDs was found to be significant (p value=0.001) among the responders. 70 % of the responders disagree that low intake of fruit and vegetables can contribute to obesity. Less than half responders have the knowledge that eating a lot of fat can contribute to cancer. More than half of the responders (53.7%) did not know that eating a lot of salt can contribute to certain cancer; similarly, 51.8% did not know that low intake of vegetables can contribute to certain cancer. Less than half responders did not know that low intake of fruit can contribute to certain cancers. Less than 50 % responders did not know that obesity as a risk factor of certain cancers.

Another study conducted as part of the Heart-Health-Associated Research and Dissemination in the Community project in the Jhaukhel – Duwakot Health Demographic Surveillance Site in two urbanizing villages near Kathmandu, where women participants were predominant where only 11% of the population identified overweight and physical activity as causes of CVDs.¹³ But according to our study 85 % of the respondents have the knowledge that physical inactivity can lead to heart diseases in women and 90.4% of the participants have knowledge that obesity can cause heart diseases.

A research article on public knowledge of CVDs and its risk factors in Kuwait showed that respondents were much better knowledgeable of CVD risk factors, nearly half of them were aware of eight or nine risk factors and the knowledge was significantly higher among females [18].

The commonest risk factors identified were smoking, obesity, unhealthy diet and physical activity. While in our study 90% of women knew that increased fat diet can contribute to CVD and 85% know that lack of physical activity can lead to CVD. Similarly, 90.4% of women knew that obesity can contribute to CVD and 96.9% of women know that smoking can contribute to CVD.

Limitation:

The study was conducted for short period of time i.e., 2 weeks due to which we could not cover all the houses of all the wards of Inaruwa Municipality. Due to the time limitation, the study was done taking 4 wards randomly out of 10 wards of Inaruwa Municipality. As a result, the study couldn't be generalized.

The person who is suffering from the disease may have the knowledge regarding the concerned disease and risk factors. But in our study, we did not assess the disease status of the participants which might limit us on generalizing the knowledge status of the individual in the community.

Conclusion

Women's knowledge was assessed through different questionnaire framed on dietary and behavior related risk factors of NCDs in urban setting of Eastern Nepal. Through this study, the study observed that only 53.3% of responders have the knowledge of dietary and behavior related determinants of NCDs. We also observed that there was significant association between knowledge and following socio-demographic characteristics namely caste/ethnicity, education, occupation, income, education of head of the household and socioeconomic condition. But it was observed that there was no significant association between knowledge and following socio-demographic characteristics namely age, marital status

and religion. Though there is significant association between physical activity and knowledge, the women performing vigorous activity are doing it without having adequate knowledge on it; this might be due to the illiteracy where they do labor work. The women having adequate fruit intake are having sufficient knowledge regarding risk factors of NCDs. These gaps of the knowledge regarding the risk factors emphasizes that the nutrition recommendation should be done in appropriately in the community.

Recommendation

Awareness of the benefits of fruit and vegetables should be given to the general population of women. Nutrition education messages need to be communicated within the general population of women. Practical education strategies such as cooking, tasting and eating may be most effective, as education without associated skills development is likely to result in limited behavior change.

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