

Effect of intervention on the behavioural risk factors of type 2 diabetes: a study among high risk adults in a tribal area of western Maharashtra

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Abstract

Background: The recent World Health Organization report suggests that number of diabetic subjects in India is projected to increase to nearly 80 million by 2030. Behaviour change communication is one of the strategy to prevent type 2 diabetes. **Objectives:** To study the effect of Behaviour Change Communication on behavioural risk factors of type 2 diabetes. **Materials and Methods:** This is an interventional study carried out during December 2010 to November 2012 in a field practice area under Rural Health Training Centre (RHTC) attached to the Department of Community Medicine of a tertiary care municipal hospital in Mumbai. Forty one tribal adults in 25 - 64 yrs age group having 3 or more risk factors for type 2 diabetes were included in this study. Data was collected at baseline and 12 months after behaviour change communication. Data was analyzed in SPSS Version 15.0 using Paired t test. **Results:** Thirty five participants completed the study. Significant reductions in both the tobacco and alcohol use occurred between baseline and 12 months after intervention. Improvement in fruit and vegetable intake was observed at 12 months but it was not statistically significant. **Conclusion:** Behaviour Change Communication is effective strategy to reduce the behavioural risk factors of type 2 diabetes among high risk tribal adults.

Keywords: Type 2 diabetes, behaviour change communication, high risk adults, tribal area

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INTRODUCTION

Once considered a "disease of affluence," diabetes now places a significant burden on developing countries. Type 2 Diabetes is now a common and serious global health problem associated with older age, obesity, family history of diabetes, physical inactivity, other unhealthy lifestyle and behavioral patterns.¹ With an estimated 50.8 million people living with diabetes, India, the world's second most populous country, now has the world's largest

diabetes population, followed by China with 43.2 million.² Approximately 70% of India's population lives in rural areas in resource-poor settings where the increasing prevalence and chronic nature of type 2 diabetes become added burdens. Lack of awareness and poor access to quality care increase diabetes related complications such as visual impairment and blindness, kidney failure, heart attack, stroke and features of autonomic dysfunction.^{3,4} 80% of type2 diabetes is preventable by lifestyle intervention like changing diet, increasing physical activity and improving the living environment.⁵ Behaviour change communication can be used as a strategy to reduce the risk factors of type2 diabetes. The objective of this study was to study the effect of behaviour change communication on the behavioural risk factors of type 2 diabetes among high risk tribal adults in 25 - 64 yrs age group.

MATERIALS AND METHOD

This is an interventional study conducted in field practice area under Rural Health Training Centre (RHTC)

attached to the Department of Community Medicine of a tertiary care municipal hospital in Mumbai during December 2010 to November 2012. There are 4 Padas and a Village (Tembha village, Tal. Shahapur, Dist. Thane) in close vicinity of RHTC which constitute population of 2000. A baseline survey was conducted in 4 padas and Tembha village during 2010-2011 to screen all adults in 25 - 64 yrs age group for type2 diabetes. Sample size (n) for baseline survey was calculated using the Software OpenEpi version 2.3 by the formula

$$n = [DEFF * Np(1-p)] / [(d^2 / Z^2_{1-\alpha/2} * (N-1) + p * (1-p)].$$

Total Population = 2000

% population in age group 25- 64 yrs = 45 % (Maharashtra: NFHS III).⁶

Adult population i.e. Individuals of age group 25-64 years in the area (N) =

$(2000 * 45) / 100 = 900$

Anticipated % frequency (p) = 3.1 %

Confidence limits as +/- percent of 100 (d) = 1.55 % (i.e. half of prevalence)⁷

Design effect = 1

Confidence level = 95%

Sample size (n) = 330 considering 5% dropout using open Epi software.

Systematic random sampling method was used to select the houses to be included in the study. The sampling interval was 2.5 (sampling interval = $900 / 330 = 2.72 \approx 2.5$).

1st house was selected randomly. It was not included in the study. All eligible adults in the age group of 25 - 64 yrs from every 2nd and 5th house (i.e. 2nd, 5th, 7th, 10th ...) were interviewed and examined. If the house selected to be included in the study was locked a second visit was done, even then if the house was found locked then the next immediate house was included in the study. Using the above sampling technique 342 adults in the age group of 25 - 64 yrs were included covering the entire study area. Out of 342 adults screened, 96 were found to have 3 or more risk factors for type2 diabetes. Risk factors included obesity⁸ (B.M.I. $\geq 25 \text{ kg/m}^2$), family history of diabetes and at least 1 of the following conditions- hypertension⁹ i.e. B. P. $\geq 140/90 \text{ mm of Hg}$ or abdominal obesity¹⁰ (waist circumference $\geq 90 \text{ cm}$ in males, $\geq 80 \text{ cm}$ in females.) or sedentary lifestyle. Out of those 96 adults, 41 were belonging to tribal category. All those 41 were included in this interventional study. Of the 41 subjects, 35 completed the study. Hence the study population was 35. Approval of Institutional Ethical Committee was obtained. After taking informed consent, data was collected from all the study participants using a pretested semi-structured questionnaire by personal interview method at baseline and 12 months after behaviour change communication. It included demographic data collection and behavioural assessment. Demographic information

was comprised of age, sex, education, occupation, religion, caste, educational level, socioeconomic status, family history of diabetes, Behavioural assessment included information regarding diet, smoking and alcohol intake. Dietary pattern included information about number of servings of fruit and vegetables consumed per week.

INTERVENTION

In this study Behavior Change Communication intervention^{11, 12} was given in 6 sessions to all individuals in groups of 4-5 in the first 6 months after baseline data collection. In brief, the sessions were designed to increase participants' knowledge of healthy eating habits, to provide options and practical suggestions for positive lifestyle changes, and to familiarize participants with motivational and problem-solving strategies. Participants were visited once a month during the last 6 months to discuss progress, address concerns, and provide encouragement. While communicating with tribal people, language barrier was overcome by taking help of local health personnels. Data was collected, compiled and then entered in Microsoft Excel 2007 and analyzed in SPSS Version 15.0. Chi square test and Paired t test were used for analysis

RESULTS

Initially there were 41 participants. During the course of the study, 6 participants (12.5%) were lost due to death or migration to another area. Thus 35 participants completed the entire 12-month study. There were 19 male and 16 female participants. Maximum respondents (60%) were in the age group 45-64 years. Tribal include Mahadev Koli, Thakur and varli (fig.!). More than 3/4th (77.1%) were illiterate. As per modified BG Prasad classification^{13,14} for economic status, majority of the study subjects (94.2%) belonged to class V and VI [table 1]. Overall significant reductions in both the tobacco and alcohol use occurred between baseline and 12 months after intervention. Also improvement in fruit and vegetable intake was observed at 12 months. But it was not statistically significant. [table 2].

Table 1: Socio demographic profile of study participants (N=35)

Age structure	Frequency	Percentages
25-44 Years	14	40%
45- 64 Years	21	60%
Sex Composition		
Male	19	54.3%
Female	16	45.7%
Education		
Lliterate	27	77.1%
Primary	7	20%
Secondary	1	2.9%
Socio economic Class		

BPL and Poor	33	94.2
Lower middle and above	2	5.8

Table 2: Changes in Behavioural risk factors among participants at 12 months after intervention

Behavioural risk factors	Baseline	12 month	P value
Tobacco use Frequency/day	4.94±4.85	3.5± 3.2	0.01
Alcohol consumption Ml/day	221.13±	153.40±	0.03
Fruit and vegetable frequency /week	4.8±3.01	6.3±3.5	0.3

(using Paired t test for comparison between baseline and 12 months: values shown as: mean± SD)

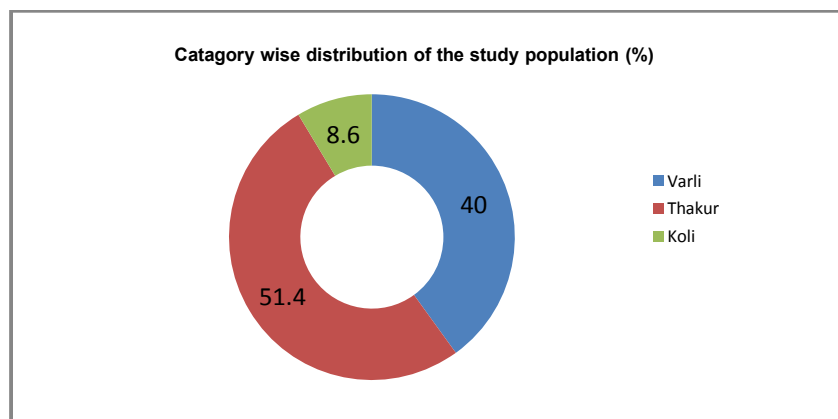


Figure 1

DISCUSSION

Significant reduction in both the tobacco and alcohol use occurred after intervention in our study. The Da Qing IGT and Diabetes Study¹⁵ reported the opposite findings i.e. there was no change in alcohol intake as well as no dietary changes. This may be due to difference in the content and duration of intervention and or long period of follow up in Da Qing IGT and Diabetes Study. The present study reported improvement in dietary habits after intervention. Similar results were obtained in the study³ conducted by Balagopal P. *et al* in a rural area of Tamilnadu.

CONCLUSION AND RECOMMENDATIONS

The Behaviour change communication was effective in reducing the behavioural risk factors and improving dietary patterns of the study participants. With the increasing rate of type 2 diabetes disproportionately affecting Indians, behavior change communication of vulnerable communities can be used as effective public health strategy to prevent type2 diabetes or to minimize its complications. A larger scale study is recommended to further test the effectiveness of this intervention in a wide geographic area.

LIMITATIONS

In this study no control group was used for comparison.

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