

# Testing of a dental student-administered multidisciplinary health promotion program

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## ABSTRACT

**Background:** A multidisciplinary approach involving healthcare students for health promotion has been recommended. With this view, the primary phase of the integrated health promotion program (IHPP) was designed and pilot tested. **Methods:** A pre-post-intervention study was conducted among 55 housewives of two self-help groups in India. The intervention consisted of a motivational interview, interactive session with a nutritionist, group discussion, personal hygiene training, and an illustrative reinforcement leaflet. Interventions were provided by trained dental students. The evaluation was based on outcomes from six tools specifically tailored for the program. These were the health self-regulation self-efficacy scale (HSSS), visual analogue scale (VAS) for self-health perception, oral health knowledge and attitude questionnaire, motivational interview, group discussion, and personal hygiene demonstration test. **Results:** Statistically significant change in mean pre- and postprogram scores in HSSS ( $P < 0.001$ ), its two components, metacognitive component, action component, as well as VAS ( $P = 0.001$ ) indicated a change in health-related perceptions in the participants. Mean oral health knowledge score (6.1), as well as attitude score (3.8), was fair. Most of the participants were able to demonstrate personal hygiene and tooth brushing correctly; take collective decisions about their health, plan changes in their diet, and resolve upon bringing about healthy changes in their lifestyle. **Conclusion:** The program evaluation indicated successful intervention and may be replicated in a larger population. Healthcare student population may be used in developing countries to bring about an attitude change in the underprivileged population through an IHPP.

**Keywords:** Behavior change, interdisciplinary studies, motivation, program evaluation, public health education for professionals

## Introduction

Reform in primary health care structure through the strengthening of health promotion programs (HPPs) is recommended to reduce disease burden in low expenditure, low growth health economies such as India.<sup>[1,2]</sup> In such countries, the presence of the large number of healthcare students<sup>[3,4]</sup> may serve as a

potential resource for augmenting health promotion workforce in primary care akin to nonphysician clinicians.<sup>[5-10]</sup> Such HPPs may also diversify professional education.

Malnutrition and obesity have been important health-related concerns throughout the developing world. Obesity has been identified as an important risk factor for chronic diseases in the Indian population. In addition to nutrition-related condition, dental disease is a widespread health problem in India as well as the world over. Oral health promotion has been advocated as a means of reducing the burden of oral disease in society. It is, therefore, important to address measures for healthy food

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Received: 03-08-2019 Revised: 22-08-2019 Accepted: 19-09-2019

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmipc.com

**DOI:**  
10.4103/jfmipc.jfmipc\_563\_19

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**How to cite this article:** Sharma A, Jain M, Singh S, Yadav NR, Chahar P, Monga A, *et al.* Testing of a dental student-administered multidisciplinary health promotion program. J Family Med Prim Care 2019;8:3230-5.

habits as well as oral and personal hygiene in a program directed toward health promotion in India as well as other parts of the developing world. Additionally, HPPs for nutritional and dental conditions; even though advocated,<sup>[1,11-17]</sup> have been inadequately implemented due to lack of public health education reforms and trans-disciplinary approach in health education.<sup>[18,19]</sup>

A structured program that integrates public health education with primary health care for health promotion in a trans-disciplinary approach may, therefore, be effective in providing the much-needed health promotion in India as well the other developing countries. Therefore, an integrated health promotion program (IHPP) was developed and evaluated in India. The program aimed at activating a part of the population to be effectively trained for health promotion practices in the future phases of the program.

This paper details the development and pilot evaluation of primary phase of IHPP utilizing dental students in an underprivileged community in a district in the Northern State of India. It aims at testing the ability of the interventional program activating underprivileged housewives toward improved knowledge and attitude on oral health, nutrition, and personal hygiene.

## Materials and Methods

### Ethical considerations

The study protocol was approved by the Institutional Ethics Committee at Manav Rachna Dental College, Faridabad (23-03-2018). Informed consent was obtained from all the individuals before participation.

### Participants and procedures

This study was a pre-post-intervention study and was carried out during July 2018. The study population was housewives in an NGO run family support program in a district in North Indian State. Housewives from all 65 households under the NGO run program were approached for the study. Beneficiaries of this NGO program comprised of families that lacked ownership of any five of the index amenities such as television, refrigerator, washing machine, motorcycle, toilet, safe drinking water, own house, and agricultural land.

Housewives were chosen as the cohort for intervention as they form the most important part of family in India. Informed consent was obtained from the subjects, and in case the subject was illiterate, the study objectives were explained to the subject in the presence of literate impartial witness and consent was taken accordingly.

Eight final year dental students of a dental institute in northern India were trained for this program through a 4-day training program. The training was imparted to the students of clinical batch posted in the Department of Public Health Dentistry, who gave an agreement for participation. The medium of training was through multimedia presentations followed by discussions.

The program was developed according to criteria for a successful health education intervention.<sup>[20,21]</sup> It sought behavioral change with an emphasis on lifestyle modification and care-seeking behavior.<sup>[22]</sup> During the intervention, housewives recruited for the program were divided into four groups for ease and efficiency of conducting the program. Each group was assigned an undergraduate moderator who conducted the health promotional program and an observer who assessed the group-based health education activities as per the program outline [Table 1].

### Measures

The evaluation was done through six tools [Table 2] developed for this program. These tools were constructed based on evidence from earlier researches. The tools were health self-regulation self-efficacy scale (HSSS),<sup>[23-25]</sup> a visual analogue scale (VAS),<sup>[26]</sup> oral health-related knowledge and attitudes questionnaire,<sup>[27,28]</sup> motivational interview,<sup>[29]</sup> group discussion, and personal hygiene demonstration (PHD) test.<sup>[30-32]</sup> Validation for HSSS was done through secondary analysis to determine factor structure through maximum likelihood estimation (220 individuals), internal consistency and reliability (51 individuals), and convergent validity (74 individuals), respectively.

**Table 1: Outline of the program**

Day	Activity	Objective
1	a. Dental screening	Soliciting participation into the program
	b. Participant recruitment	First stage of awareness - making population aware of presence of disease. Explaining the purpose of the study to prospective participants and recruiting them.
	c. Preintervention evaluation	Understanding the pre intervention characteristics (ItQ and WAS) of the recruited participants.
2	a. Motivational interview on health and nutrition	Improving health and nutrition related attitude.
	b. Interactive session with nutritionist	Providing knowledge on nutrition
3	a. Oral hygiene group Discussion	Improving oral hygiene related knowledge and attitudes
	b. Personal hygiene group Discussion	Improving personal hygiene related knowledge and attitudes.
4	a. Tooth brushing Demonstration	Providing oral hygiene related skills
	b. Hand washing Demonstration	Providing personal hygiene related skills
	c. Health education leaflet	Reinforcement of knowledge and skills
	d. Postintervention evaluation	Assessing change from baseline (HSSS, VAS, oral health-related questionnaire and PHD test.)

HSSS=health self-regulation self-efficacy scale, VAS=visual analogue scale, PHD=personal hygiene demonstration

**Table 2: Evaluative tools**

Assessment tool	Aim	Details	Theoretical Basis
Health self-regulation self-efficacy scale	To evaluate participant's self-management attitude and readiness to bring about healthy changes in lifestyle.	The questionnaire consists of six questions to be answered on a 5-point Likert scale.	Self-efficacy
Visual analogue scale (VAS)	To evaluate participant's perception of wellness.	VAS with pictographic illustration of various wellness stages of on a scale of 0–100 in intervals of 10.	Determinants of physical, psychological and social wellness.
Oral health-related knowledge and attitude questionnaire	To evaluate Oral Health related knowledge and attitudes attained after the program.	- A 14-question instrument to be answered on a dichotomous scale (yes/no). - Number of correct answers determined the score.	- Adapted from oral health KAP questionnaires used previously in India and China.
Motivational interview	Motivational and Evaluation tool to assess effectiveness through participation, ability of the participants to answer and make collective decisions.	- A 23-question instrument. - The interview dealt with three topics: cost of health and disease, responsibility for health care, and importance of balanced diet.	- Shared decision making through motivational interviewing
Group discussion	Motivational and Evaluation tool to assess effectiveness through participant's change in belief and understanding about personal hygiene	Undergraduate student moderated discussion along with comments and explanations by the moderator.	Determinants of personal, household, and oral hygiene
Personal hygiene demonstration test	To assess the personal hygiene skills learnt by the participants.	Evaluated through undergraduate students	Determinants of personal, household, and oral hygiene

## Statistical analysis

Data tabulation was done on Microsoft excel and was analyzed using SPSS version 16. HSSS and VAS were tested for changes in pre- and postprogram scores using a paired *t*-test. *P* value of <0.05 was considered significant for the whole analysis.

## Results

Data were collected from 55 housewives out of a total of 65 housewives (84.61% response rate). Reasons for nonparticipation were that they were not available for participation (*n* = 3) and participants did not attend the complete program (*n* = 7). The average age of the participants was 34.4 years.

HSSS validation was done through three studies. A single-factor solution was obtained by factor analysis through maximum likelihood estimation. The goodness of fit test showed a statistically significant value ( $\chi^2 = 37.199$ , *P* < 0.01). The Cronbach's alpha value for test-retest reliability was 0.849. Positive correlations were observed among items. Pearson's correlation coefficient value between HSSS and the new general self-efficacy scale was 0.602 (*P* < 0.001). Mean interitem correlation coefficient for the scale was 0.342 with a variance of 0.031. The details of validation are beyond the scope of this study. The dataset for validation study for HSSS is available and may be obtained elsewhere.<sup>[33]</sup>

The average HSSS score changed from 14.62 preprogram to 18.96 postprogram (*P* < 0.001). Also, a statistically significant change was observed in scores for metacognition component, which changed from a mean score of 6.03–7.09 (*P* < 0.001) postintervention. The mean action component scores also changed from 8.58 to 11.87 (*P* < 0.001) postintervention.

There was a significant change in the mean VAS score from 51.81 to 70.36 (*P* < 0.001). Fair mean knowledge and attitude scores of 6.1 and 3.8, respectively, were observed for oral health-related questionnaire postprogram [Table 3].

During the motivational interview, observers noted that all the groups were able to calculate the costs of health care as well as understand the responsibility of health and the importance of healthy diet. They questioned the nutritionist freely. The groups were able to plan changes in their diet collectively. Group discussion showed the ritual and social basis of cleanliness with ignorance about correct oral and personal hygiene. The groups agreed on the need to know more about personal hygiene. PHD test showed that most of the participants (*n* = 22) developed correct tooth brushing and hand washing skills.

## Discussion

Education on health and prevention of diseases as well as maternal health care are two essential elements of primary health care. The IHPP aimed at obtaining adequate knowledge levels, as well as improving attitudes and practices about health care among housewives. Therefore, the program aimed at improving these two important aspects of primary care. Additionally, one of the major goals of taking housewives as participants was the percolation of healthy practices into the family lifestyle.

The IHPP addressed a multitude of concerns collectively in a single program. It utilized students, whose participation in such programs was hitherto limited as compared with other providers.<sup>[34–36]</sup> In the presence of HPPs involving nonhealthcare undergraduates,<sup>[37]</sup> a program with healthcare undergraduates

**Table 3: Distribution of participants according to oral health related knowledge and attitude questionnaire**

	Low	Average	High
Knowledge level	5 (9.10%)	24 (43.63%)	26 (47.27%)
	Poor	Fair	Good
Attitude level	6 (10.90%)	29 (52.74%)	20 (36.46%)
Knowledge questions	Correct	Incorrect	
Is regular visit to dentist useful?	50	5	
Does sweet diet stop caries?	28	22	
Does regular tooth brushing prevent gum disease?	52	3	
Is brushing once daily enough?	45	10	
Should forceful brushing be done?	34	21	
Saline rinses are adequate for good oral health	21	34	
Gum disease is caused due to dirty teeth	49	6	
Dirty teeth cause caries	51	4	
Attitude questions	Correct	Incorrect	
Dental disease can become serious	52	3	
Dental disease can cause other health problems	50	5	
I cannot prevent dental caries	32	23	
Dental disease is less important than other disease	35	20	
All people lose teeth in old age	18	37	
Tooth pain can be cured by medicine	19	36	

becomes relevant. It also gave the students practical experience in the upcoming field of lifestyle medicine.<sup>[38,39]</sup>

This program trained the students about patient engagement and culturally aligned care through short training. It was in contrast to an HPP in the US for Pharmacy students to enable a specific patient intervention for asthma, as involving elaborate curriculum changes.<sup>[40]</sup> Another HPP in Peru conducted lecture series for undergraduate medical students and their faculty to teach HIV orphans and citizens about basic good health and disease prevention, but the program was not evaluated.<sup>[41]</sup>

IHPP also imparted the much emphasized interprofessional education for working in underserved areas. Additionally, integration of HPP with healthcare education reduced the cost of program implementation through workforce augmentation, thus, making it fruitful for developing countries. The study showed that health education and promotion brings about positive behavioral change and activation even in healthy individuals. This program may also reduce the healthcare costs similar to “patient activation” intervention.<sup>[42]</sup>

The present program improved health-related knowledge, attitudes, and skills in housewives. Similar to IHPP, a study done in Kerala, India, has shown that activation of women toward positive health-related behavior may lead to health-related

social change.<sup>[21,43,44]</sup> IHPP gave the housewives a platform for discussion of their health-related concerns. Motivational interview, group discussion, and PHD proved to be key activities in bringing about positive behavioral change. This program took the people from the known to the unknown. It was, hence, able to strike a chord with them and was popular. The housewives were satisfied and considered the participating students with a credible source of information.

The present program was a curriculum enrichment activity for the participating students that shifted teaching from the classroom to the community setting. The participating students could also understand and feel the healthcare needs of society and were, therefore, motivated to impart health education. Including such a program in regular teaching may help in making the student understand the importance of health education and role of culturally correct care in patients’ behaviors.<sup>[45]</sup>

Sessions were short and were spread over a week. This ensured the interest of the participating population as well as gave them ample time to think about the discussions and imbibe them. The housewives had new questions at the outset of every new session. This showed their interest and participation. The involvement of community leader (NGO) added to the success and acceptability of the program.

There were some limitations to the program. While answering the HSSS, there was a negative shift of scores for a few housewives for some questions. Its reason was that these housewives perceived that they had done irreparable harm to themselves through their previous lifestyle. Reassurance to housewives should be included as a part of the main program to prevent this in the future. Another major experience from this program was that it fell short of motivating the population to completely attend the program till the end. A part of the future main program will be an initial door to door contact and use of messaging services from mobile phones to ensure recruitment, motivation, and evaluation.

The primary phase of IHPP will create a cohort of activated housewives. In future phases, these housewives will be trained and put to action for health promotion in their respective families. Healthcare student population may be used in the developing countries to bring about an attitude change in the underprivileged population through a cost-effective and IHPP. Such a program will be able to address capital and manpower shortage in primary health care, which is a major barrier for health promotion in developing countries. The program provides a win-win situation for the community, students as well as the future policymakers.

The present program did not incur a huge cost and used basic health education techniques to activate the participants. So, it can also be advocated as a part of corporate or institutional social responsibility. Similar programs can prove beneficial in providing cost-effective solutions to many healthcare woes in the developing world.

This program targeted the felt needs of the people in addition to introducing new concepts. In this way, it also took them from the known to the unknown. It was, hence, able to strike a chord with the population. The population that the program served formed an important and responsible part of the family and society. The life of the housewives is centered around the family and they found this program valuable in their welfare. The undergraduate dental students could understand the healthcare needs of society and its importance and be, therefore motivated to impart health education. The participants also considered the students a credible source of information. The program utilized various methods of health education. Individual and group participation was ensured, which helped in maintaining the interest of the participants. The program had a strong theoretical basis and was scientifically constructed and evaluated. Finally, it aimed at making a self-adopted behavioral change in the community that made a positive impact on the population and motivated them to embrace lifestyle change.

Future researches can be aimed at the effectiveness of the program on various other student populations, such as medical, homeopathic, Ayurvedic, Yunani, nursing, social work, and physical education. Evaluating the long-term results of the program in different geographical and cultural areas in India, SAARC nations and other developing countries worldwide can be another endeavor. Suitable changes should be made to the program according to the cultural and healthcare requirements of the country.

## Conclusion

The pilot study for the primary phase of the IHPP was successful in bringing about a positive change in the health-related behavioral outlook of the participants and integrated health promotion in primary health care with dental education. The change was qualitatively assessed and confirmed quantitatively by the measurement tools. It also indicated that dental students could be involved successfully in community health promotion. This pilot program paves the way for replication of the study in a larger population.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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