Comparison of effectiveness of two methods of health education on cancer awareness among adolescent school children in a rural area of Southern India

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ABSTRACT

Introduction: Cancer is a major public health problem worldwide. There is an urgent need for a reinvigorated and tailored approach to promote cancer prevention and treatment-related health education, especially among the youth. Objective: (1) To assess the knowledge and awareness of the students of adolescent age group about cancer. (2) To compare two methods of health education on improving awareness about cancer among these students. Methodology: We conducted an interventional study among students (both male and female) of adolescent age group (10–19 years) who attend Government school (Lakkur and Kugur) in Sarjapur PHC between May and September 2014. A standard pretested validated questionnaire-adopted from Cancer Awareness Measure-translated into Kannada was used. After pretest, health education was given by two modes: in Lakkur - child to child, and Kugur - routine (lecture). Following 2 days of health education, an immediate posttest was conducted. After 2 weeks, the second posttest was conducted. Results: In Kugur School, 96 students and Lakkur School, 104 students participated. The mean age group of students in both the schools was 14 years. The preexisting knowledge scores between both the schools were not statistically significant. There was a significant increase in knowledge of the posttest scores in all three domains of cancer questionnaire in both the schools. Child to child program in Lakkur School was found to be more effective in increasing the knowledge scores. Conclusion: To increase the awareness of cancer among schools using child to child method for health education. School curriculum should include sessions on cancer education and reinforced to students periodically. To sustain this measure, school teachers could be trained in nuances of cancer prevention and treatment.

Keywords: Adolescent school children, cancer awareness, child to child, health education India

Introduction

Cancer is a major public health problem worldwide. Estimated prevalence of cancer in India is around 2–2.5 million with about 0.7 million new cases occurring every year. Out of these, nearly half die every year.¹¹ The earliest initiatives of cancer control in India date back to 1975 when Government of India first launched a National Cancer Control Programme. Since then India has come a long way. In 2010, the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke was launched for better control of noncommunicable diseases (NCDs). Despite these efforts, the cancer control in India is still in the fledgling stages.¹² The scenario in India is complicated and influenced adversely by the lack of awareness in the community, social taboos, and stigma leading to advanced presentation, rampant tobacco use, poverty, and resource crunches. The single most cost-effective strategy identified for better cancer control was emphasis on primary prevention. The success of a public health program for cancer control depends to a large extent on the level of awareness among the potential

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beneficiaries about different aspects of the disease. Adolescent in any society is a viable resource; they have the tremendous power to bring change in the society and hence, intensive health education interventions should be targeted toward them.

**Need for the study**

Various studies are available on the level of knowledge about cancer among college students in India. Results from these studies indicate that there is an urgent need for a reinvigorated and tailored approach to promote health education to increase awareness about cancer prevention and treatment among the educated youth in India. The next logical approach as substantiated by various studies would be to assess the impact of health education to improve awareness regarding cancer. But unfortunately, scanty data are available from India regarding the knowledge and also the impact of health education, especially among adolescent school children. In addition, in most cases, they have specifically focused on individual malignancies such as breast cancer or cervical cancer and their specific interventions. This study is not limited to a specific malignancy but rather focuses on various risk factors and preventive aspects of all common cancers in general and hence portends to be more helpful. Hence, this study was undertaken with the objective of exploring knowledge and awareness of the school students of adolescent age group about cancer and also to assess the impact of health education on improving awareness about cancer on these students.

**Objectives**

- To assess the knowledge and awareness of the students of adolescent age group about cancer
- To compare two methods of health education on improving awareness about cancer among these students.

**Methodology**

We conducted an interventional study among students (both male and female) of adolescent age group (10–19 years) who attend government school (Lakkur and Kugur) in Sarjapur PHC between May and September 2014. A standard pretested validated questionnaire adopted from Cancer Awareness Measure (CAM)-translated into Kannada was used. Assent form was obtained from the children. After pretest, health education was given by two modes: In Lakkur - child to child and Kugur - routine (lecture). Following 2 days of health education, an immediate posttest was conducted. After 2 weeks, again another posttest was conducted.

The sample size was calculated as follows:

\[
\begin{align*}
n &= [Z_1 - \alpha \sqrt{2p} (1 - p) + Z_1 - \beta \sqrt{p1 (1 - p1) + p2 (1 - p2)}/(p1 - p2)]. \\
&= 104, 24 students volunteered.
\end{align*}
\]

Sample size estimation for difference in proportion:

\[
\begin{align*}
p1 &= 0.25 \\
p2 &= 0.07
\end{align*}
\]

Based on the previous studies: 0.25%, 0.07%.

Therefore, 92 children should be there in each group.

The questionnaire had the following parts:
- Sociodemographic details
- Three domains - general knowledge of cancer, knowledge on warning signs of cancer, and knowledge on risk factors of cancer adapted from CAM.

**Procedure**

This study was approved by the Institutional Ethical Committee.

Lesson plan was prepared:

**Outline of the session (topic guide)**

- Definition of cancer
- Epidemiology
- Prevention and control
- Some common cancers.

**Health education in Kugur School**

After getting permission from the principal of the school, we got all the 8th and 9th students in the main hall (n = 96). Using lecture method, namely, board and chalk with show cards, interactive session was conducted. Clarifications from the students were taken at the end of session. Students then summarized the session.

**Health education in Lakkur School - child to child**

After getting permission from the principal, we got all the 8th and 9th students in the main hall (n = 104), 24 students volunteered for the session. We divided them into three groups with 8 in each. Group 1 did - general knowledge - skit in Kannada, Group 2 on - warning signs - song and skit, and Group 3 - risk factors - skit and show cards. Groups then practiced for 30 min. Health education was given for all the students. Clarifications from the students were taken at the end of session. Students then summarized the session.

**Statistics and analysis of the data**

The data were entered and coded in Microsoft Excel and analyzed using SPSS version 16, St. Johns College for proportions, frequencies, and associations. Measures of central tendency, dispersion, and Chi-square tests were used to analyze data. We considered \( P < 0.05 \) as significant. When more than 20% of cells in tables had value < 5, then we considered Fisher’s exact test for significance. Tests of associations such as Chi-square test applied and effect of intervention by Wilcoxon ranked test and Mann–Whitney test.

**Results**

The study population comprised - in Kugur School, 96 students and in Lakkur School, 104 students participated. The mean age group of students in both the schools was 14 years. The demographic details are represented in Table 1. They were...
Distribution of age and gender were equally distributed in both the school children. Table 2 represents existing preknowledge - good score among both the schools and they did not vary.

Tables 3 and 4 represents pre - and post - comparison of knowledge regarding cancer in Kugur and Lakkur Schools using Wilcoxon test and there was a significant increase in knowledge of the students in both the schools on all three domains - general knowledge of cancer, risk factors, and warning signs of cancer. Figure 1 represents that increase in knowledge as assessed by the posttest two was persistent in Lakkur School where child to child program was conducted. Table 5 represents comparison of scores of two schools, using Mann–Whitney U-test where it is evident that difference in scores of pretest with immediate posttest and posttest after 2 weeks, in Lakkur School gain in knowledge scores are persistent. This shows that child to child program in Lakkur School is more effective in increasing the knowledge of cancer among the students.

Table 1: Demographic details

| School (%) | Kugur School, frequency | Lakkur School, frequency |
|------------|-------------------------|--------------------------|
| Age (years) |                        |                          |
| 13         | 16 (16.7)               | 8 (7.7)                  |
| 14         | 46 (47.9)               | 49 (47.1)                |
| 15         | 31 (32.3)               | 42 (40.4)                |
| 16         | 3 (0.03)                | 5 (4.8)                  |
| Mean (years)±SD | 14.2±0.8             | 14.4±0.7                |
| Gender     |                        |                          |
| Males      | 54 (56.3)               | 41 (40.4)                |
| Females    | 42 (43.7)               | 63 (59.6)                |
| Mothers education |              |                          |
| Illiterate | 47 (49)                 | 34 (32.7)                |
| Primary    | 20 (20.8)               | 39 (37.5)                |
| Middle school | 29 (30.2)             | 27 (26)                  |
| High school | 0                      | 4 (3.8)                  |
| Fathers education |            |                          |
| Illiterate | 48 (50)                 | 37 (35.6)                |
| Primary    | 18 (18.8)               | 29 (27.8)                |
| Middle school | 24 (25)             | 31 (29.8)                |
| High school | 6 (6.2)                | 7 (6.8)                  |
| BG Prasad socioeconomic status classification | |                          |
| Class I    | 1 (1)                   | 1 (1)                    |
| Class II   | 9 (9.4)                 | 13 (12.5)                |
| Class III  | 55 (57.3)               | 54 (51.9)                |
| Class IV   | 29 (30.2)               | 30 (28.8)                |
| Class V    | 2 (2.1)                 | 6 (5.7)                  |
| SD: Standard deviation | |                          |

Table 2: Existing preknowledge - good score

| School (%) | Kugur, frequency (%) | Lakkur, frequency (%) |
|------------|----------------------|-----------------------|
| Domains    |                      |                       |
| General knowledge | 61 (63.5)     | 59 (56.7)            |
| Warning signs | 46 (47.9)      | 48 (46.1)            |
| Risk factors | 39 (40.6)      | 41 (39.4)            |

Table 3: Pre-and post-comparison of knowledge regarding cancer-Kugur School

|                      | Median (IQR) | Wilcoxon test (Z) | P        |
|----------------------|--------------|-------------------|----------|
| General knowledge    |              |                   |          |
| Pretest              | 6 (5‑6)      |                   |          |
| Immediate posttest   | 8 (6‑8)      | 9.6               | 0.001    |
| Posttest conducted after 2 weeks | 6.5 (6‑7) | -2.6               | 0.001    |
| Warning signs        |              |                   |          |
| Pretest              | 4 (3‑6)      |                   |          |
| Immediate posttest   | 9 (8‑9)      | -8.2              | 0.001    |
| Posttest conducted after 2 weeks | 6 (6‑7) | -7.3               | 0.00     |
| Risk factors         |              |                   |          |
| Pretest              | 4 (3‑5)      |                   |          |
| Immediate posttest   | 11 (10‑11)   | -8.5              | 0.00     |
| Posttest conducted after 2 weeks | 10 (8‑11) | -8.4               | 0.00     |

Table 4: Pre- and post-comparison of knowledge regarding cancer-Lakkur School

|                      | Median (IQR) | Wilcoxon test (Z) | P        |
|----------------------|--------------|-------------------|----------|
| General knowledge    |              |                   |          |
| Pretest              | 5 (4‑6)      |                   |          |
| Immediate posttest   | 8 (6‑8)      | -8.8              | 0.00     |
| Posttest conducted after 2 weeks | 6 (5‑7) | -4.9               | 0.00     |
| Warning signs        |              |                   |          |
| Pretest              | 4 (3‑5)      |                   |          |
| Immediate posttest   | 9 (8‑9)      | -8.8              | 0.00     |
| Posttest conducted after 2 weeks | 8 (8‑9) | -8.7               | 0.00     |
| Risk factors         |              |                   |          |
| Pretest              | 3 (2‑5)      |                   |          |
| Immediate posttest   | 11 (10‑11)   | -8.8              | 0.00     |
| Posttest conducted after 2 weeks | 11 (10‑11) | -8.8               | 0.00     |

Figure 1: Knowledge on warning sign. (1) Kugur School, (2) Lakkur School

Discussion

The burden of cancer in India is on the rise. More than 70% of all cancer deaths occurred in low- and middle-income countries. The leading causes of NCDs deaths in 2008 were cardiovascular diseases (17 million deaths or 48% of NCD deaths), cancers
Poor awareness toward cancer has been proved to be a serious hindrance to successful implementation of cancer control programs. There is a lack of evidence around the effectiveness of school-based interventions designed to raise adolescents’ cancer awareness. Adolescents can be easily reached through schools and are thereby a useful arena for raising adolescent cancer awareness. Schools are established loci for health promotion. Examples include the World Health Organization Global School Health Initiative[12] which is designed to instil school-wide health promotion and education activities in policy and practice by changing school health policies, physical environment, community relationships, personal health skills, and health services.[13] Schools vary in choice of health topics addressed and strategies adopted but there are few school-based programs designed to raise cancer awareness and none that have been evaluated.[14] Literature about the effectiveness of school-based health interventions provides useful pointers for developing cancer awareness programs. Smoking is one of the most researched adolescent health behaviors. Smoking is, however, an addictive behavior and therefore may require a different type of intervention compared to raising adolescent cancer awareness because core determinants and moderating factors for addictive and nonaddictive behaviors are likely to vary. The most well-documented field of health promotion in adolescents is related to health education. The review included four RCTs involving combinations of video and print material in secondary schools (children aged 12–16) and reported that all studies found significant increases in self-reported knowledge of skin cancer risk, measured by questionnaire. Study done in New Delhi[9] in 2014 with only oral health education method showed improvement in knowledge of 7% and another study in the UK[10] in 2013 with same method showed 23%, whereas our showed significant and persistent change in knowledge about cancer using child to child method of health education. Studies[8,9] done based on the child to child method of health education concludes that through proper training of peers and motivation the child to child approach to health education improves the knowledge level of children on common issues concerning children in an effective way.

### Table 5: Comparison of scores of two schools

| Difference in scores                  | Median (IQR) | Mann-Whitney U-test (Z) | P  |
|---------------------------------------|--------------|-------------------------|----|
| GK (pre-immediate post)               | 2 (1-3)      | 3 (2-4)                 | 6.1| 0.00 |
| GK (pre- and post-2 weeks)           | 0.3 (0-1)    | 1 (0-2)                 | 2.6| 0.008|
| WS (pre-immediate post)              | 4 (2-6)      | 4 (3-5)                 | 0.3| 0.7  |
| WS (pre- and post-2 weeks)           | 2 (1-4)      | 4 (3-5)                 | 6.0| 0.00 |
| RF (pre-immediate post)              | 7 (5-8)      | 7 (6-9)                 | 2.02| 0.04 |
| RF (pre- and post-2 weeks)           | 5 (4-7)      | 7 (5-8)                 | 4.4| 0.00 |

### Conclusion

There was a significant increase in knowledge of the posttest scores about cancer after health education. Child to child program in Lakkur School was found to be more effective in increasing the knowledge scores, and it would be nice to increase the awareness of cancer among schools using child to child method for health education.

School curriculum should include sessions on cancer education and reinforced to students periodically. To sustain this measure, school teachers could be trained in nuances of cancer prevention and treatment.

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### Conflicts of interest

There are no conflicts of interest.

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