Effectiveness of Self-Instructional Module (SIM) on Knowledge Regarding Cancer of Cervix and Its Prevention Among Married Women

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Research note

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Abstract

Objective: Self-Instructional Module (SIM) is the self-contained typed written instructional material about the importance and prevention of cervical cancer prepared by an investigator. Instructional material given to the study subjects after a pre-test and self-evaluate by them before the post-test. Therefore, the present work aimed to find the effectiveness of SIM regarding cancer of the cervix and its prevention among married women in India.

Results: SIM administrated to 60 married women after assessing pre-test knowledge on the prevention of cancer cervix. The study showed that there was a greater increase in mean post-test knowledge score 24.92 (±2.560) compared to that of the mean pre-test knowledge score 8.65 (±3.369). The paired t-test value for overall knowledge was 30.73 with the post-test mean percentage score (83.06) was high when compared to that of the mean percentage of pre-test knowledge score (28.83).

Introduction

Cervical cancer is the most common cancer among women in 45 countries of the world, ranked second-highest, and the incidence rate is two times greater reported in developing countries (85%) than developed [1]. Worldwide, 266,000 women die of cervical cancer each year [2, 3]. In India 2nd most common female cancer in women aged 15 to 44 years, and 2018 estimates 469.1 million women are at risk for cervical cancer ≥ 15 years of age, an annual number of cervical cancer cases 96,922 and deaths 60,078 [4, 5].

Prevention at the population level is an effective strategy than considering non-modifiable factors like genetic, age, and environment to control and for early detection [6, 7]. The women can enhance and understand about prevention of cancer cervix by an educational strategy [2]. Information, education communication about routine screening on Human Papilloma Virus (HPV) tests, and resources accessible to all populations with cost-effective [8]. Increasing awareness of health promotive and protective measures among women is a prime step to lower the incidence and death due to cancer of the cervix [9]. Education campaigns [10] and involving media are effective for increasing knowledge on cancer of the cervix among women in rural areas and also intend to get vaccinate [11–14].

Even various programs and propaganda on cancer cervix, there is a lack of knowledge and beliefs of an Indian woman to follow healthy lifestyle practices, and screening for early detection is still stigmatic. A study concluded that educational materials to be provided in their local language with training programs may increase women to go for early screening and increases knowledge on preventive aspects [15, 16].

Intensify women’s knowledge with the national health care system should facilitate and encourage early diagnosis and therapy on prevention and control of cancer of the cervix. [17–19].

Due to a lack of knowledge on cancer of the cervix, women are unaware of the prevalence, prevention, and early detection. Since married women are at more risk and based on various literature and incidences, the researcher felt the necessity of providing information regarding cervical cancer and its prevention in married women through SIM and evaluate the effectiveness of SIM.

Methods

Study area and period: Jeppu Urban Family Welfare Centre, Mangalore, India, from December 2018 to March 2019.

Study design and sampling process: This study used a pre-experimental one group pre-test and post-test design. The purposive sampling technique was used to recruit study participants.

Selection criteria: The inclusion criteria were (i) married women aged 18–45 years (ii) participants who willing to participate voluntarily (iii) read and write Kannada (local language). Exclusion criteria: women undergone hysterectomy and who already have cervical cancer.

Sample size determination: The sample size was estimated with a 13% expected difference in standard deviation taken from a previous study [20], 90% power at 95% confidence interval with an expected 10% dropout, a minimum sample of 42 participants needed. The sample size was increased by 60 to adjust drop out and non-response.

Study variables

Extraneous variable: socio-demographic variables were age, education, occupation, monthly income, and the number of children.

Independent variable: SIM regarding cancer of the cervix and its prevention.

Dependent variable: meaning, risk factors, symptoms, diagnostic test, treatment, and prevention regarding cancer of the cervix.
Data collection tool: It consists of 30 multiple choice questions from the area of meaning (2), risk factors (5), symptoms (5), diagnostic test (4), treatment (4), and preventive aspects of cervical cancer (10). Each correct answer was given a score of '1' and each wrong answer was given a '0' score. The total score was 30.

Operational definition

Knowledge: refers to the correct response of the married women to the items in the structured questionnaires. Inadequate knowledge: score (1–10) considered ≤ 50%; moderately adequate knowledge: score (11–20) considered 51–75%; adequate knowledge: score (21–30) considered 76–100%.

Data quality assurance:

Data collector was trained to gather and accumulate data. A pilot study was run in 10% of the samples in the Attavar primary health center at Mangalore.

Conceptual Framework:

Open general system theory based on Ludwig Von Bertalanffy [21, 22] utilized in this study to achieve the effect of SIM. It has five major elements such as input (socio-demographic variables), process (administration of SIM), output (knowledge level), environment (information gained from mass media), and feedback.

Intervention:

SIM is an instructional package with a single conceptual unit of the content on cancer cervix and its prevention, that helps in individualized learning prepared by an investigator by previous references [2, 23, 24]. The study participants understand the meaning, risk factors, symptoms, stages, diagnostic tests, treatment, and prevention mainly focused on vaccination, quit active and passive smoking, avoid exposure to HPV and multiple sexual partners, use condoms, stress reduction, dietary modification, menstrual hygiene, sexual and genital hygiene practice, control use of oral contraceptives, annual gynecological examination, and pap smear examination and visual inspection test with acetic acid when and where the resources available. The study participants systematically go through the module from the beginning to the end with their own time to read this material slowly and carefully within the scheduled time. Women were encouraged to go for self-evaluation given at the end of each unit. Compare their answers with answers provided in the key answers. Duration to complete SIM was one month.

Data processing and analysis:

The data were analyzed using SPSS 26.0 for Windows (SPSS, IBM, USA). Statistical significance was set at \( P < 0.05 \). The results were analyzed by calculating basic statistics and paired t-test for pre-/post-comparisons of variables and knowledge level.

Ethical considerations

Informed consent was obtained from study participants on a voluntarily and made all the effort to protect their information confidentially.

Result

Socio-demographic characteristics

The mean age of respondents was 35.7 (± 7.5) years, and the highest proportions were 37–45 years. The majority of the study participants were married 208 (73%). Study subjects were high school education 20 (33.3%). Most of them were self-employed 13(21.7%). Income below Rs.3000 among the respondents was 21(35%). The more number of the respondents had two children 28 (46.7%).

Effectiveness of SIM

The results of the study are presented in Tables 1, 2, and 3. Overall knowledge of married women on cancer cervix and its prevention in pre-test and a post-test mean score was 8.37 and 24.85; standard deviation 3.08 and 2.27. The paired t-test value was 39.419.
Table 1
Comparison between pre-test, post-test knowledge scores and demographic variables (n = 60)

| Variable        | Pre-Test | Post-Test |          |          |          |          |
|-----------------|----------|-----------|----------|----------|----------|----------|
|                 | Inadequate | Moderately Adequate | Total | Moderately Adequate | Adequate | Total |
|                 | N (%)     | N (%)     | N (%)    | N (%)    | N (%)    | N (%)    |
| Age             |           |           |          |          |          |          |
| 18–27           | 14 (25.0) | 2 (50.0)  | 16 (26.7)| 7 (70.0) | 9 (18.0) | 16 (26.7)|
| 28–36           | 21 (37.5) | 0 (0.0)   | 21 (35.0)| 3 (30.0) | 18 (36.0)| 21 (35.0)|
| 37–45           | 21 (37.5) | 2 (50.0)  | 23 (38.3)| 0 (0.0)  | 23 (46.0)| 23 (38.3)|
| Education       |           |           |          |          |          |          |
| Primary         | 4 (7.1)   | 1 (25.0)  | 5 (8.3)  | 2 (20.0) | 3 (6.0)  | 5 (8.3)  |
| Middle School   | 19 (33.9) | 0 (0.0)   | 19 (31.7)| 4 (40.0) | 15 (30.0)| 19 (31.7)|
| High School     | 20 (35.7) | 0 (0.0)   | 20 (33.3)| 4 (40.0) | 16 (32.0)| 20 (33.3)|
| Diploma         | 12 (21.4) | 3 (75.0)  | 15 (25.0)| 0 (0.0)  | 15 (30.0)| 15 (25.0)|
| Graduate        | 1 (1.8)   | 0 (0.0)   | 1 (1.7)  | 0 (0.0)  | 1 (2.0)  | 1 (1.7)  |
| Occupation      |           |           |          |          |          |          |
| Professional    | 8 (14.3)  | 2 (50.0)  | 10 (16.7)| 0 (0.0)  | 10 (20.0)| 10 (16.7)|
| Non-Professional| 11 (19.6) | 0 (0.0)   | 11 (18.3)| 1 (10.0) | 10 (20.0)| 11 (18.3)|
| Self-Employed   | 13 (23.2) | 0 (0.0)   | 13 (21.7)| 4 (40.0) | 9 (18.0)| 13 (21.7)|
| Daily Wages     | 11 (19.6) | 2 (50.0)  | 13 (21.7)| 2 (20.0) | 11 (22.0)| 13 (21.7)|
| Unemployed      | 13 (23.2) | 0 (0.0)   | 13 (21.7)| 3 (30.0) | 10 (20.0)| 13 (21.7)|
| Monthly Income  |           |           |          |          |          |          |
| ≤ Rs. 3000      | 19 (33.9) | 2 (50.0)  | 21 (35.0)| 5 (50.0) | 16 (32.0)| 21 (35.0)|
| Rs. 3001–5000   | 11 (19.6) | 0 (0.0)   | 11 (18.3)| 1 (10.0) | 10 (20.0)| 11 (18.3)|
| Rs. 5001–8000   | 17 (30.4) | 0 (0.0)   | 17 (28.3)| 2 (20.0) | 15 (30.0)| 17 (28.3)|
| Rs. 8001–10000  | 4 (7.1)   | 2 (50.0)  | 5 (8.3)  | 1 (10.0) | 4 (8.0)  | 5 (8.3)  |
| ≥ Rs. 10001     | 5 (8.9)   | 1 (25.0)  | 6 (10.0) | 1 (10.0) | 5 (10.0) | 6 (10.0) |
| No. of Children's|         |           |          |          |          |          |
| None            | 1 (1.8)   | 0 (0.0)   | 1 (1.7)  | 0 (0.0)  | 1 (20.0)| 1 (1.7)  |
| One             | 21 (37.5) | 3 (37.5)  | 24 (40.0)| 4 (40.0) | 20 (40.0)| 24 (40.0)|
| Two             | 28 (50.0) | 0 (0.0)   | 28 (46.7)| 5 (50.0) | 23 (46.0)| 28 (46.7)|
| Three or more than three | 6 (10.7) | 1 (25.0)  | 7 (11.7)| 1 (10.0) | 6 (12.0)| 7 (11.7)|
Table 2
Association between pre-test, post-test knowledge scores and demographic variables (n = 60)

| Variables | N  | Pre-Test | Post-Test | Adjusted Mean | Paired t-test value |
|-----------|----|----------|-----------|---------------|---------------------|
|           |    | M   | SD  | M   | SD  | M   | SD  |                 |
| Age       |    |     |     |     |     |     |     |                 |
| 18–27     | 16 | 9.31| 3.70| 23.75| 9.31| 14.43| 3.74| 15.44           |
| 28–36     | 21 | 7.00| 2.07| 25.33| 2.47| 18.23| 2.03| 41.32           |
| 37–45     | 23 | 8.95| 3.08| 25.17| 1.64| 16.21| 2.90| 26.75           |
| Education |    |     |     |     |     |     |     |                 |
| Primary   | 5  | 8.60| 4.97| 22.60| 1.67| 14.00| 1.67| 08.36           |
| Middle School | 19 | 7.63| 1.86| 24.26| 1.85| 16.63| 2.24| 32.34           |
| High School | 20 | 8.05| 2.50| 24.05| 2.16| 16.00| 3.09| 23.12           |
| Diploma   | 15 | 9.60| 4.18| 27.33| 0.62| 17.73| 4.06| 16.01           |
| Graduate  | 1  | -   | -   | -    | -   | -    | -   | -               |
| Occupation|    |     |     |     |     |     |     |                 |
| Professional | 10 | 10.80| 4.13| 25.00| 1.63| 14.20| 3.52| 12.75           |
| Non-Professional | 11 | 7.90| 1.57| 25.81| 1.72| 17.90| 1.14| 52.27           |
| Self-Employed | 13 | 6.77| 2.20| 24.30| 2.92| 17.53| 3.95| 16.01           |
| Daily Wages | 13 | 9.07| 3.73| 25.07| 2.25| 16.00| 3.83| 15.06           |
| Unemployed | 13 | 7.76| 2.08| 24.23| 2.38| 16.46| 1.80| 32.83           |
| Monthly Income | |     |     |     |     |     |     |                 |
| ≤ Rs. 3000 | 21 | 8.80| 3.44| 24.28| 2.32| 15.47| 3.60| 19.69           |
| Rs. 3001 – Rs. 5000 | 11 | 7.45| 1.96| 24.63| 1.85| 17.18| 2.35| 24.16           |
| Rs. 5001 – Rs. 8000 | 17 | 7.47| 20.45| 25.58| 2.12| 18.11| 2.68| 27.77           |
| Rs. 8001 – Rs. 10000 | 5  | 9.20| 4.32| 25.20| 2.94| 16.00| 2.44| 14.60           |
| ≥ Rs. 10001 | 6  | 10.33| 3.50| 24.83| 2.78| 14.50| 3.67| 9.67            |
| No. of Children’s | |     |     |     |     |     |     |                 |
| None      | 1  | -   | -   | -    | -   | -    | -   | -               |
| One       | 24 | 8.87| 3.55| 25.12| 2.32| 16.25| 3.32| 23.932          |
| Two       | 28 | 7.53| 2.13| 24.75| 2.42| 17.21| 2.97| 30.634          |
| Three or more than three | 7  | 9.71| 4.23| 24.00| 1.82| 14.28| 3.54| 10.660          |

*aAll variables paired t-test value is significant at p-value < 0.05
### Table 3
Effects of SIM on cervical cancer: area wise mean, standard deviation and mean percentage (n = 60)

| Variables          | Pre-test M ±SD | M % | Post-test M ±SD | M % | Paired t-test value |
|--------------------|----------------|-----|-----------------|-----|---------------------|
| Meaning            | 1.30 ±0.743    | 65  | 1.88 ±0.324     | 94.17| 5.45                |
| Risk factors       | 1.82 ±1.172    | 36.33| 4.35 ±0.755     | 87  | 14.71               |
| Symptoms           | 1.58 ±1.169    | 31.67| 4.35 ±0.777     | 87  | 13.98               |
| Diagnostic test    | 0.52 ±0.701    | 12.92| 2.93 ±0.936     | 73.33| 15.82               |
| Treatment          | 0.97 ±1.008    | 24.17| 3.37 ±0.736     | 84.17| 16.13               |
| Prevention         | 2.47 ±1.241    | 24.67| 8.03 ±1.248     | 80.33| 26.29               |
| Overall Knowledge  | 8.65 ±3.369    | 28.83| 24.92 ±2.560    | 83.06| 30.73               |

*aAll variables paired t-test value is significant at p-value < 0.05*

### Discussion

In this existing study, most women range from 37–45 years with mean ages of 35.7 (± 7.5). This finding was seen in the study conducted in Nigeria [25] respondents were in the age of 35–54 years with mean ages of 38.54 (± 11.06) and Korea [26] participants were in the age of 36–59 years with a mean age of 44.8 (± 6.4) years respectively.

In this present study, there was an increased knowledge in post-test 83.06% (p < 0.05) after introducing SIM when compared to pre-test 28.83%. Previous studies consistent with the result conducted in Nigeria among women knowledge level on cancer cervix from 2–70.5% (p < 0.0001) after structured group health education [27]; study reported from Vietnamese American women [28] overall knowledge on cancer cervical education program from 30–88% (p < 0.001) and Vietnam rural areas among married women [29] level of knowledge increased from (27.5%-54.3%) in the intervention group (p < 0.05); study conducted in Cameroon [19] women who received the educational intervention had a significantly higher knowledge about HPV and cervical cancer in the intervention group 81.6% (p < 0.05)

The current study underpinned with system theory with the attainment of the effectiveness of SIM. A systematic review [30] concluded that the use of theory-based educational interventions significantly increased cervical cancer screening rates by more than double (OR, 2.46, 95% CI: 1.88, 3.21). Through the administration of SIM, the results are expected to increase the level of knowledge in urban areas. The study conducted in rural areas also had similar results from previous studies. It may provoke women with preventive measures and follow up care regularly for their future.

### Limitations

The study sample included only married women between the ages of 18–45 years, but it can include all the women above the age of 15 years irrespective of marriage. The contemporary study used a pre-experimental one group pre-test post-test design; it can be conducted as a randomized control trial. Information collected from the women was based only on written responses. This study has limited to urban areas, it can be applied to rural areas.

### Abbreviations

HPV: human papilloma virus; IBM: International Business Machines; M: mean; OR: odds ratio; SIM: self-instructional module; SD: standard deviation; SPSS: Statistical Package for Social Sciences.

### Declarations

#### Ethics approval and consent to participate

Ethical approval was obtained from the Ethics Review Committee of Masood College of Nursing and formal permission obtained from Jeppu Urban Health Centre, Mangalore, India. Written informed consent was obtained from all participants before the data collection tools were administered, and confidentiality was maintained.

#### Consent for publication
Not applicable.

**Availability of data and materials**

All data generated or analyzed during the present study are included in this published article.

**Competing interests**

The authors declare that they have no competing interests.

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**Authors’ contributions**

DRR: conception, design, acquisition of data, analysis, and interpretation of data and drafting the manuscript. GM: critically reviewed the design, analysis, interpretation, and the drafted manuscript. AT: participate in reviewing the design, data analysis, interpretation, and the drafted manuscript. RS: involved in drafting and critically revising the manuscript for important intellectual content. All authors read and approved the final manuscript.

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