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Original Article

Nursing Section

Effect of Teaching Intervention on Cancer Facts to Reduce Cancer Social Stigma in Rural Adults-A Pilot Study

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ABSTRACT

Introduction: Worldwide, cancer is the second major cause of death and is accountable for an approximately 9.6 million deaths in the year 2018. Cancer carries a stigma due to its link with death. This affects the health seeking behaviour of the cancer patients.

Aim: To evaluate the effect of teaching intervention on cancer facts to reduce social stigma among rural adults.

Materials and Methods: This quasi-experimental pretest post-test control group study was conducted from 5th January 2021 to 5th February 2021, in rural community at Mangalore, Karnataka, India. Hundred adults between 18-65 years of age were selected based on purposive sampling technique and randomly assigned to an experimental and control group. Data was collected using baseline proforma and self-designed cancer social stigma scale which is a 5-point rating scale, consisting of 20 statements. The total score of each participant was calculated and categorised as severe, moderate, mild and no social stigma. Individual teaching intervention was given on first day to the intervention group and post-test was conducted after seven days on both the groups. The data were analysed using the t-test and chi-square tests.

Results: The total study population of 100 adults was divided into intervention group (mean age 33.34±4.46 years) and control group (mean age 36.22±4.07 years) of 50 subjects each. Before the teaching intervention, the mean and Standard Deviation (SD) of social stigma scores of intervention group and control group were 59.9±13.6 and 61.38±9.8, respectively. After the intervention, the score of the intervention group and control group were 30.62±4.5 and 61.44±10.8, respectively. Independent t-test showed that there was a significant difference in social stigma score between intervention group and control group after the intervention (p-value <0.05).

Conclusion: Study findings revealed that teaching intervention on cancer fact is effective in reducing social stigma among general population. Since the prevalence of cancer is high, there is an immediate need to educate the rural population on prevention, myths and realities of cancer.

Keywords: Cancer prevention, Health education, Rural population

INTRODUCTION

Worldwide, cancer is the second major cause of death and is accountable for an approximately 9.6 million deaths in the year 2018; about 1 in 6 deaths are related to cancer [1]. The 5-year prevalence for cancer is estimated to be 43.80 million [2]. Stigma related is manifested as non disclosure of cancer diagnosis to others. When a person has a stigma that separates them from others, it can make them look bad in the eyes of others and jeopardise their sense of self-identity [3]. In addition, individuals with cancer may interpret differently than others or appraise potential threats to their identity that they may combat in the workplace, social mingling, and the media as stigmatising or not [4]. Certain types of cancers have been found to carry more stigma, e.g., lung cancer; as it is associated with tobacco use, although not all lung cancer patients have a history of smoking [5]. Due to ignorance, fear, and social stigma, many women present with stage III or IV cancer which requires surgery and extensive treatment. Many cancer deaths can be prevented if they are diagnosed and treated at an early stage [6].

Stigma affects the quality of life of a patient with cancer and the treatment seeking behaviour of the affected individual. Patient-physician communication remains a vital step for mitigating cancer stigma. The diagnosis of cancer is often concealed from the patients due to the insistence of families, sociocultural norms, and the burden associated with it [7,8]. This affects the decision making process and the development of coping strategies for the patient [9].

Major causes of stigma include the physical changes due to cancer and its treatment, and body image perception and the beliefs related to cancer and its management. Stigma is also manifested in different ways such as use of local word for cancer, non disclosure of cancer diagnosis and discrimination of cancer patients [10]. The stigma may also extend to the family members, particularly in rural villages. It also impacts the whole family by affecting the socio-economic status as well as the role of the person due to the consequences of delayed diagnosis. If the cancer patient is elderly, he may not even be provided with better care [11].

The physical, psychological, and social suffering caused by cancer can be reduced by raising community awareness about risk factors, prevention, warning signs, screening measures and treatment. Unfortunately, there is a lack of awareness among the general public in developing countries like India regarding the many risk factors and preventive methods for common cancers, such as early detection through screening and treatment of precancerous lesions [12,13]. Lack of proper knowledge and myths about cancer in common people and failure to involve the people in the cancer education programmes are the root causes of delayed attendance of cancer cases and consequent poor outcome [14]. The only practical option in our socio-economic context for promoting early identification of many types of cancer is to raise "cancer awareness" among the general public. Apart from a lack of knowledge, additional social and cultural hurdles that delay treatment seeking are also crucial to consider [15].

With lack of awareness about cancer, a person is less likely to adopt any behaviour that can reduce cancer risk or positive health-seeking. There is a need to create awareness about cancer as a number of myths about cancer exist. These myths about cancer not only create stigma for the cancer patients and their families, but also affect the health seeking behaviour of the cancer patients. Cancer-

related stigma draws considerable research interest, but only few studies have been conducted in the past. Hence, the study aimed to assess the level of social stigma and to evaluate the effect of teaching programme on cancer facts to reduce social stigma in the general population.

MATERIALS AND METHODS

The quasi-experimental pretest post-test control group study was conducted in rural community at Mangalore, Karnataka, India. Ethical approval was obtained from the Institutional Ethics Committee of AJ Institute of Medical Sciences (Ref.no. AJEC/REV/128/2020). Data was collected from 5 January 2021 to 5 February 2021. Permission was obtained from Dakshina Kannada District Health Officer. Hundred adults who gave consent and met the inclusion criteria were selected and randomly assigned to the intervention and control groups by flipping a coin, 50 in each group.

Inclusion criteria: Adults between 18-65 years of age and who can read and respond in Kannada or English were included in the study.

Exclusion criteria: Those adults already diagnosed with cancer were excluded from the study.

Permission was obtained from Dakshina Kannada District Health Officer. Hundred adults who gave consent and met the inclusion criteria were selected and randomly assigned to the intervention and control groups by flipping a coin, 50 in each group.

Sample size calculation: It was done by using the formula: $n=(\sigma1+\sigma2)^2\ (Z\alpha+z\beta)^2/d^2$ where $Z\alpha=1.96$ at 95% confidence level, $Z\beta=1.28$ at 90% power,$\sigma1+\sigma2$=combined standard deviation and d=Mean difference. With 95% confidence level and 90% power sample size was estimated to be 37 in each group. With 10% attrition total sample size was approximated to 41 in each group.

Study Procedure

Questionnaire

Demographic data was collected on the first day. Structured self-designed rating scale was used to assess cancer social stigma [Appendix-1]. Rating scale was validated by the seven subject experts who gave their agreement regarding the correctness and relevance of the items. The English version of the validated instrument was translated into Kannada and the language validity was established by translating it back to English. To find out the reliability of the tool, it was administered to 10 rural adults and reliability was calculated by cronbach's alpha method, yielded an 'r' value 0.86. Home visit was scheduled for all the participants with the help of Asha health workers of the particular village and individual teaching session of 45 minutes was provided on first day to an intervention group. Teaching intervention included the facts about cancer, risk factors, modalities of treatment and myths related to cancer, causes, prevention, diagnosis, treatment and reality via a power point presentation, in their home setting. Post-test was conducted after seven days. Control group which did not receive teaching and the intervention group were provided with hand out on cancer facts and myths after the post-test.

STATISTICAL ANALYSIS

The collected data was coded, organised, and analysed using Statistical Package for the Social Sciences (SPSS) version 20.0. Demographic characteristics of the sample, level of social stigma of adults were analysed using frequency (n) and percentage (%). The statistical tests used were; paired t-test for finding the significant difference between the pretest and post-test social stigma scores within the intervention group, independent t-test for finding the significant difference between intervention and control group post-tests and chi-square test to determine the association of level of social stigma with demographic variables at the level of p-value <0.05.

RESULTS

The mean age of the intervention group was 33.34±4.46 years and that of control group was 36.22±4.07 years [Table/Fig-1]. Male to female ratio in intervention group was 1:1.17 and in control group was 1:3.16. In both the groups, majority of the participants had mild to morderate social stigma [Table/Fig-2]. The pretest mean scores showed no statistical difference between two groups [Table/Fig-3]. Item-wise frequency and percentage of pretest is shown in [Table/Fig-4].

Demographic characteristics		Intervention (n=50)		Control (n=50)		p-value
		n	%	n	%	
Age (in years)	18-29	22	44	16	32	0.234
	30-41	16	32	20	40	
	42-53	11	22	9	18	
	54-65	1	2	5	10	
Sex	Male	23	46	12	24	**0.021**
	Female	27	54	38	76	
Religion	Hindu	8	16	3	6	0.084
	Muslim	41	82	42	84	
	Christian	1	2	5	10	
Educational status	Primary	22	44	12		0.115
	Secondary	11	22	20	24	
	Pre-University	12	24	11	40	
	Graduate/Diploma	5	10	7	22	
	Postgraduate				14	
Occupational status	Unemployed	15	30	4	8	**0.003**
	Home maker	15	30	30	60	
	Labourer	9	18	13	26	
	Business	4	8	2	4	
	Private employee	4	8	-	-	
	Government employee	3	6	1	2	
Family income (Rs/month)	<5,000	15	30	18	36	0.121
	5000 to 15,000	17	34	11	22	
	16,001 to 20,000	10	20	13	26	
	20,001 to 30,000	4	8	8	16	
	30,001	4	8	-	-	
Family member with cancer	Yes	3	6	5	10	0.461
	No	47	94	45	90	

[Table/Fig-1]: Distribution of the sample population according to their demographic characteristics.
Intervention group mean age :33.34±4.46; Control group mean age: 36.22±4.07

Group	Level of social stigma		Frequency	%
Intervention (n=50)	Pretest	Severe	6	12
		Moderate social stigma	19	38
		Mild social stigma	20	40
		No social stigma	5	10
	Post-test	Mild social stigma	2	4
		No social stigma	48	96
Control (n=50)	Pretest	Mild social stigma	26	52
		Moderate social stigma	19	38
		Severe social stigma	5	10
	Post-test	Mild social stigma	23	46
		Moderate social stigma	21	42
		Severe social stigma	6	12

[Table/Fig-2]: Distribution of the sample according to the level of social stigma.

Groups	Pretest	Post-test	p-values
Intervention	59.90±13.62	30.62±4.51	**0.001**
Control	61.38±9.88	61.44±10.85	0.975
p-values	0.5354	**0.001**	

[Table/Fig-3]: Comparison of inter and intra group pretest and post-test scores, depicting the effect of teaching intervention.

[Table/Fig-2]. The post-test mean scores showed statistical difference between two groups; p-value <0.05 [Table/Fig-3].

Item-wise frequency and percentage of post-test is shown in [Table/Fig-5]. In the interventional group, there was significant association of level of social stigma scores with age, p<0.05 [Table/Fig-6].

	Interventional group (N=50)					Control group (N=50)				
QN.	SA	A	N	DA	SDA	SA	A	N	DA	SDA
Q 1	7 (14%)	6 (12%)	10 (20%)	8 (16%)	19 (38%)	6 (12%)	7 (14%)	13 (26%)	15 (30%)	9 (18%)
Q2	11 (22%)	9 (18%)	14 (28%)	7 (14%)	9 (18%)	8 (16%)	14 (28%)	14 (28%)	9 (18%)	5 (10%)
Q3	19 (38%)	10 (20%)	10 (20%)	3 (6%)	8 (16%)	11 (22%)	13 (26%)	13 (26%)	8 (16%)	5 (10%)
Q4	12 (24%)	3 (6%)	11 (22%)	16 (32%)	8 (16%)	6 (12%)	12 (24%)	12 (24%)	15 (30%)	5 (10%)
Q5	21 (42%)	4 (8%)	8 (16%)	7 (14%)	10 (20%)	9 (18%)	6 (12%)	15 (30%)	17 (34%)	3 (6%)
Q6	16 (32%)	17 (34%)	6 (12%)	1 (2%)	10 (20%)	12 (24%)	9(18%)	16 (32%)	9 (18%)	4 (8%)
Q7	13 (26%)	7 (14%)	13 (26%)	7 (14%)	10 (20%)	9 (18%)	14 (28%)	18 (36%)	5 (10%)	4 (8%)
Q8	10 (20%)	6 (12%)	22 (44%)	9 (18%)	3 (6%)	10 (20%)	10 (20%)	17 (34%)	10 (20%)	3 (6%)
Q9	7 (14%)	6 (12%)	17 (34%)	15 (30%)	5 (10%)	14 (28%)	5 (10%)	13 (26%)	14 (28%)	4 (8%)
Q10	9 (18%)	6 (12%)	24 (48%)	7 (14%)	4 (8%)	13 (26%)	11 (22%)	15 (30%)	6 (12%)	5 (10%)
Q11	12 (24%)	13 (26%)	15 (30%)	7 (14%)	3 (6%)	10 (20%)	9 (18%)	20 (40%)	7 (14%)	4 (8%)
Q12	6 (12%)	7 (14%)	24 (48%)	8 (16%)	5 (10%)	7 (14%)	11 (22%)	19 (38%)	11 (22%)	2 (4%)
Q13	13 (26%)	13 (26%)	14 (28%)	5 (10%)	5 (10%)	15 (30%)	8 (16%)	14 (28%)	8 (16%)	5 (10%)
Q14	13 (26%)	10 (20%)	12 (24%))	8 (16%)	7 (14%)	12 (24%)	9 (18%)	12 (24%)	10 (20%)	7 (14%)
Q15	9 (18%)	6 (12%)	13 (26%)	17 (34%)	5 (10%)	5 (10%)	8 (16%)	15 (30%)	12 (24%)	10 (20%)
Q16	16 (32%)	6 (12%)	5 (10%)	10 (20%)	13 (26%)	8 (16%)	8 (16%)	9 (18%)	13 (26%)	12 (24%)
Q17	7 (14%)	12 (24%)	19 (38%)	10 (20%)	2 (4%)	12 (24%)	15 (30%)	16 (32%)	5 (10%)	2 (4%)
Q18	13 (26%)	15 (30%)	15 (30%)	6 (12%)	1 (2%)	20 (40%)	14 (28%)	10 (20%)	4 (8%)	2 (4%)
Q19	13 (26%)	11 (22%)	8 (16%)	10 (20%)	8 (16%)	11 (22%)	9 (18%)	11 (22%)	11 (22%)	8 (16%)
Q20	20 (40%)	10 (20%)	9 (18%)	2 (4%)	9 (18%)	12 (24%)	13 (26%)	10 (20%)	11 (22%)	4 (8%)

[Table/Fig-4]: Item-wise frequency and percentage of pretest.
A: Agree; SA: Strongly agree; N: Neutral; DA: Disagree; SDA: Strongly disagree

	Interventional group					Control group				
QN.	SA	A	N	DA	SDA	SA	A	N	DA	SDA
Q 1	0	0	0	9 (18%)	41(82%)	5 (10%)	8(16%)	12 (24%)	14 (28%)	11 (22%)
Q2	22 (44%)	28 (56%)	0	0	0	9 (18%)	10 (20%)	16 (32%)	11 (22%)	4 (8%)
Q3	28 (56%)	15 (30%)	7 (14%)	0	0	11 (22%)	12 (24%)	12 (24%)	11 (22%)	4 (8%)
Q4	0	1 (2%)	11 (22%)	14 (28%)	24 (48%)	3 (6%)	14 (28%)	15 (30%)	12 (24%)	6 (12%)
Q5	0	0	1 (2%)	24 (48%)	25 (50%)	7 (14%)	8 (16%)	13 (26%)	17 (34%)	5 (10%)
Q6	26 (52%)	23 (46%)	1 (2%)	0	0	13 (26%)	8 (16%)	14 (28%)	9 (18%)	6 (12%)
Q7	0	0	6 (12%)	24 (48%)	20 (40%)	10 (20%)	10 (20%)	20 (40%)	5 (10%)	5 (10%)
Q8	0	0	12 (24%)	17 (34%)	21 (42%)	12 (24%)	12 (24%)	17 (34%)	6 (12%)	3 (6%)
Q9	0	0	3 (6%)	24 (48%)	23 (46%)	8 (16%)	12 (24%)	10 (20%)	13 (26%)	7 (14%)
Q10	10 (20%)	17 (34%)	2 (4%)	17 (34%)	4 (8%)	10 (20%)	12 (24%)	16 (32%)	10 (20%)	2 (4%)
Q11	0	1 (2%)	6 (12%)	19 (38%)	24 (48%)	8 (16%)	9 (18%)	18 (36%)	9 (18%)	6 (12%)
Q12	0	0	5 (10%)	23 (46%)	22 (44%)	4 (8%)	15 (30%)	19 (38%)	7 (14%)	5 (10%)
Q13	0	0	9 (18%)	21 (42%)	20 (40%)	10 (20%)	12 (24%)	15 (30%)	9 (18%)	4 (8%)
Q14	27 (54%)	20 (40%)	3 (6%)	0	0	10 (20%)	10 (20%)	12 (24%)	12 (24%)	6 (12%)
Q15	0	0	0	22 (44%)	28 (56%)	4 (8%)	11 (22%)	13 (26%)	11 (22%)	11 (22%)
Q16	0	0	0	6 (12%)	44 (88%)	7 (14%)	11 (22%)	10 (20%)	14 (28%)	8 (16%)
Q17	0	1 (2%)	7 (14%)	26 (52%)	16 (32%)	8 (16%)	15 (30%)	18 (36%)	7 (14%)	2 (4%)
Q18	0	0	5 (10%)	26 (52%)	19 (38%)	18 (36%)	14 (28%)	14 (28%)	3 (6%)	1 (2%)
Q19	43 (86%)	7 (14%)	0	0	0	5 (10%)	7 (14%)	15 (30%)	11 (22%)	12 (24%)
Q20	48 (96%)	2 (4%)	0	0	0	7 (14%)	14 (28%)	12 (24%)	11 (22%)	6 (12%)

[Table/Fig-5]: Item-wise frequency and percentage of post-test.

In the intervention group, significant difference was found between pretest and post-test mean scores; p-value <0.05. In the intervention group majority of the participants had no social stigma in the post-test

DISCUSSION

In the present study, rural adults had mild to moderate level of social stigma (score 60-80) towards cancer. Similar results have been found

Variables	Intervention group (n=50)			Control group (n=50)		
	Chi-square value	df	p-value	Chi-square value	df	p-value
Age (in years)	3.95	1	**0.047**	0.02	1	0.90
Gender	0.08	1	0.78	2.20	1	0.14
Religion	3.39	1	0.07	0.02	1	0.90
Education	0.33	2	0.85	2.28	2	0.32
Occupation	1.33	1	0.25	0.64	1	0.42
Family income (in Rs)	0.35	1	0.56	0.28	1	0.60
Type of family	0.08	1	0.77	0.48	1	0.49
Family member with cancer	0.35	1	0.55	1.75	1	0.19

[Table/Fig-6]: Chi-square test showing association of pretest social stigma score with demographic variables.

in a community-based descriptive cross sectional study (n=740) done in an urban area of Rajasthan [16]. The population was studied using an interview based on a prestructured questionnaire. The study reported that more than half of the participants had negative attitude towards cancer and cancer patients [16]. The current study findings are also consistent with another study from Iran that showed a negative attitude among general populations towards the cancer [17]. A survey conducted by Cho J et al., among the general population reported that, despite the advanced clinical technologies and increased number of cancer survivors, more than 50% of the people still have negative attitudes and stereotypes toward cancer patients [18].

On the contrary, in a community based cross-sectional study conducted among 1000 women (609 rural, 391 urban) aged 13-50 years by Gangane N et al., both women from rural and urban areas demonstrated positive attitudes towards breast cancer screening practices and treatment. More than 93% of women were keen to participate in future breast cancer screening programmes [19]. The stigma associated with cancer is multifaceted. Not only the diagnosis but also the cancer care, treatment, and prevention have many myths and beliefs related to it [11].

In the current study, 55 (55%) of the participants agreed that cancer is curable when identified at the early stage, 26 (26%) of them had a myth that cancer is transmissible. Similar findings were also found in another cross-sectional study conducted in India among general population aged above 18 years in which 14% of the participants believed that cancer spreads from one person to another and 26% agreed that if cancer is diagnosed and treated at early stage, there is lesser chance of death [20].

In the present study, 24 (24%) of the participants agreed that person with cancer is to be blamed for their condition and 49 (49%) of them approved that having cancer ruins a person's career. Similarly, in a descriptive cross-sectional study (n=740) conducted in Rajasthan by Mahendra S et al., 179 (45%) participants agreed that patients himself is responsible for their condition and only 163 (40.9%) of them agreed that patient having cancer should continue to work [16].

Public education and awareness campaigns can be a reinforcing factor to reduce societal stigma about cancer by building knowledge on health. Furthermore, establishing good rapport and sensitising the general population about the consequences of stigma on cancer survivors can reduce threatening experiences.

The present study was intended to evaluate the effect of teaching intervention and also showed the significant decrease in social stigma score in intervention group in the post-test. These results are consistent with a quasi-experimental study with one group pretest and post-test design. It was conducted with the aid of a questionnaire and interview schedule among 42 'mahila mandal' women from three villages under Mugalur community health and training centre, Karnataka. Most of the participants gained knowledge about breast cancer and developed skill in doing breast self-examination [21]. It is also similar to the findings of another quasi-experimental study conducted by Sonawane RP and Mendagudli VG; with one group pre test and post-test design among 50 women of reproductive age group (15-45 years), from rural areas of Ahmednagar District in Maharashtra. The data was collected using a structured questionnaire and the study revealed that majority of women {34 (68%)} had good knowledge in the post-test [22]. There is a well-documented association between socio-economic status variation with cancer risk behaviours and mortality, which may affect perceptions of cancer stigma [23].

An interventional study was done at the Gynaecology Outpatient Department of a hospital at Tiruvalla, India, among 50 married women between 20-50 years of age. It found a significant association between pretest attitude scores with demographic variables like education, religion and family income [24]. In a Spanish representative survey on perceptions and knowledge, related to cancer, conducted among 7938 people aged 18 years or more, people aged 35-74 were more likely to have a positive attitude toward cancer information. (ref: aged 18-34) (p-value<0.001). The likelihood of a positive attitude increased with the level of education (p-value<0.001) [25]. A population based survey in England on cancer stigma and cancer screening attendance, where linear regression analysis showed that higher stigma scores were associated with being male and being from an ethnic minority background. Stigma was not significantly associated with age or social grade [26].

In contrast to another finding [24], the present study conducted among rural women did not find an association of the level of education and socio-economic status with cancer stigma. On the other hand, the current study findings are similar to the results of a cross-sectional study conducted by Raychaudhuri S and Mandal S; in a village Kawakhali and an urban slum Shaktigarh among 221 married and unmarried women, (88 urban and 133 rural) of reproductive age group (15-49 years). It showed that those who had received higher education had greater knowledge of the disease and positive attitude and this was evident among the urban women. Such an association was completely absent in a rural area inhabited by relatively poor people [27]. This underlines the importance of education in raising awareness among the general public. Therefore, awareness campaigns, especially in rural areas, need a significant re orientation so that benefits of education are realised more effectively. Larger scale follow-up surveys are needed to focus on areas of such awareness campaigns. Future studies should further examine the association of cancer stigma with variables such as educational status and socio-economic status.

Limitation(s)

As this study was conducted as a pilot study, it must be followed-up with large scale awareness raising activities, particularly in rural regions. As the intervention was given only once, further studies can be conducted with repeated interventions to ensure that the knowledge does not fade away.

CONCLUSION(S)

The study findings reveal that teaching intervention on cancer facts is effective in reducing social stigma among general population. It can be concluded that by building knowledge on cancer, myths and reality we can reduce the social stigma. Providing the right knowledge to the people on cancer and realities related to the disease and its treatment helps to adopt any behaviour that can reduce cancer risk or positive health-seeking among the people which in turn helps to early detection and treatment of cancer. Involvement of families and community in stigma mitigation strategies is needed to be successful in the long term. In a nutshell, intervention to reduce social stigma towards the cancer contribute to reduce the cancer burden of the country.

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APPENDIX-1

Rating scale to assess the cancer social stigma.

Instructions for participants

Kindly go through the following statements. Please try towards indicating how much you agree and disagree with each statement.

S. No.	Items	Strongly Agree (SA)	Agree (A)	Neutral (N)	Disagree (DA)	Strongly disagree (SDA)
1.	Cancer will spread from one person to another person					
2.	If once a person had cancer, he/she can be normal again					
3.	A person with cancer is not to be blamed for their condition.					
4.	I will get cancer if, one of my family members have cancer.					
5.	Cancer surgeries cause cancer to spread.					
6.	There is no need to hide the illness					
7.	Cancer is only due to consumption of alcohol.					
8.	Hair will never grow back after chemotherapy.					
9.	Cancer patients need to be isolated.					
10.	Doing biopsy can spread cancer.					

11.	Cancer usually ruins relationships					
12.	Having sugar will cause cancer cells to grow					
13.	Having cancer usually ruins a person's career					
14.	It is acceptable for insurance companies to reconsider a policy for someone with cancer					
15.	Radiation therapy will kill the cancer patient					
16.	Cancer occurs as a result of their sins.					
17.	If elderly gets cancer, it will not be cured					
18.	All cancer treatments are very painful					
19.	I will not try to avoid a person with cancer.					
20.	Cancer is curable when identified at the early stage					

Positive statements: 2, 3,6, 14, 19, 20

Negative statements: 1, 4,5,7,8,9,10,11,12,13,15,16,17,18

Arbitrarily categorised as follows

80-100: Severe social stigma

60-80: Moderate social stigma

40-60: Mild social stigma

20-40: No social stigma

All negative statements were scored as 5,4,3,2,1 and positive statement were scored in reverse direction