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Research Article

Knowledge and Perception Analysis of Cervical Cancer among Educated Women in South-East India

Meera Indracanti[1]*, Kavitha Nachimuthu[2] and Sefinew Tilahun[3]
[1,3]Institute of Biotechnology, University of Gondar, Gondar, Ethiopia;
[2]Dept. of Management, R.D. National Arts & Science College, Erode, Tamil Nadu, India
meerauog@gmail.com*; +251985074609
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Abstract

Nature and kind of relationship between the knowledge and perception levels about the cervical cancer through the β values and t-statistics was investigated using SMART PLS. The path coefficients showed positive significant impacts towards knowledge and perception analysis of cervical cancer. Reflective measurement, model reliability and validity of the data and average variance extracted (AVE) was between 0.592 and 0.771. Assessment of structural model showed a strong positive influence on relationship towards knowledge about symptoms, screening and vaccination, health seeking behavior, concern about obstacles and perception about cervical cancer. A positive relationship between knowledge and perception levels of educated women about the cervical cancer suggests that educated women have positive attitude to take up the screening and recommend the vaccination and willing to solve the problems of cervical cancer on time to improve their quality of life.

Keywords: Knowledge, perception levels, cervical cancer, vaccination, educated women.

Introduction

Cervical cancer is the fourth most common cancer among women in developing countries (Yeole *et al*., 2004; Swaminathan *et al*., 2009; Arbyn *et al.,* 2011; WHO, 2014). Cervical cancer is preventable and early detection and regular screening reduce the burden of cervical cancer (Turkistanli *et al*., 2003; Basu and Chowdhury, 2009; Ackerson, 2010; Gu *et al*., 2010; Leung and Leung, 2010). Low educational levels is one of the important factor for knowledge levels associated with cervical cancer incidence and mortality (Ekta *et al*., 2012; Poonam *et al*., 2012; Shah *et al*., 2012; Goyal *et al*., 2013; Shashank *et al*., 2013). Middle aged women borne mostly the burden of cervical cancer incidence and it increases with age (Mesfin *et al*., 2017) and studies show that the incidence and death rates are high in women between 35 to 54 years of age (Gakidou *et al*., 2008). HPV 16 and HPV 18 variants most frequently play a role in etiology of cervical cancer development (Clifford *et al*., 2005; Sowjanya *et al*., 2005; Laikangbam *et al*., 2007). Due to the lack of awareness about the cervical cancer symptoms, risk factors, HPV, screening methods and vaccination reducing the women's participation in screening and increasing further the disease burden (GLOBOCON, 2008; WHO, 2010). In most developing countries like India, through its national policy, introduced screening and vaccination programs for eligible population and low coverage is usually a limitation for successful control of deaths (Chamaraja *et al*., 2013). Women's successful participation in a screening depends on the perception and health perception about the cervical cancer (Basu *et al*., 2006). Considering the above facts in view, the present study was carried out to understand the nature and kind of relationship between the knowled1ge and perception levels about the cervical cancer among educated women from four selected cities of South-East India.

Materials and methods

Data collection method: A quantitative survey was conducted in selected cities such as Visakapatnam, Vizianagaram, Berhampur, and Bhubaneswar from South East India. The present study comprised of both primary and secondary data. The primary data was collected from well-structured questionnaire whereas secondary data was collected from referring numerous journals and internet sources. A total sample of 521 respondents from each of the selected cities was selected randomly by adopting the stratified random sampling technique. The data was collected from 521 respondents in the four selected cities (Visakhapatnam, Vizianagaram, Berhampur, and Bhubaneswar) in South-East India by using simple random sampling (Table 1). The collected data was tabulated, analyzed and interpreted using statistical methods using structural equation model.

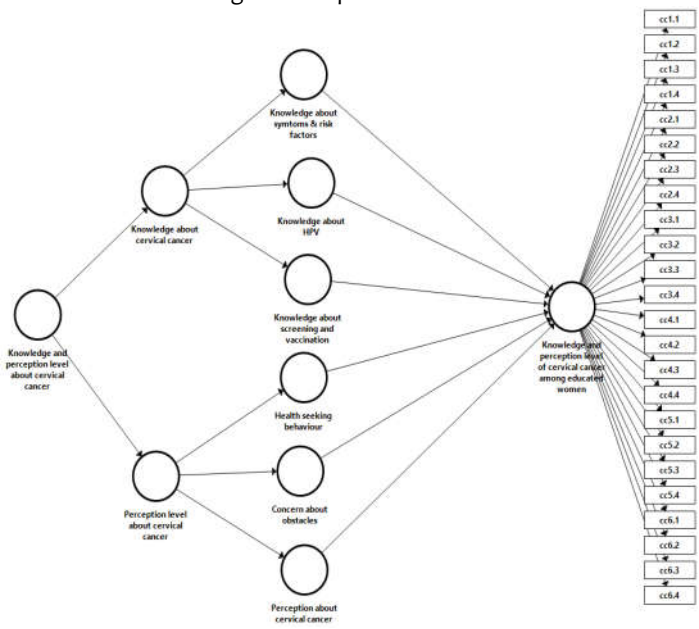
***Corresponding author**

Table 1. Sample size and sampling results.

Selected cities	Quota	Respondents	Qualified responses
Visakapatnam	260	265	252
Vizianagaram	260	260	253
Berhampur	260	265	252
Bhubaneswar	260	260	252
Total	540	550	512

Source: Primary data

Fig. 1. Conceptual model.



Source: Author

Qualitative research: Questionnaire was well planned and prepared referring literature and distributed to the respondents according to the study requirement. Questionnaires were filled by the respondents in order to find the knowledge and perception analysis of cervical cancer among educated women. The views and thoughts of the respondents were used for improving the study. A structured questionnaire was prepared with Likert 5-point scale with anchors "strongly disagree", "disagree", "neutral", "agree" and "strongly agree" and used for the study purpose. The 5-point Likert scales are widely used especially in scaling responses in survey research framework and it was the suitable method to understand the relationship between knowledge and perception about the cervical cancer. Questionnaire had two parts, the first part was thoughtful of sample respondents' demographic profile information and second part was to study the knowledge and perception analysis of cervical cancer among educated women.

Data analysis: SMART PLS (version 3) was used for investigating the data to find the variables related to the knowledge and perception analysis of cervical cancer among educated women. The study was supportive to design the structural equation model. The structural equation model was measured after the validity and reliability test and the measurement model was known. The intention of calculating the structural equation model was to test the research hypotheses using the bootstrap resampling procedure with the support of SMART PLS Version 3. In this method, the strength of associations between the independent and dependent variable were measured and the values were established through the β values and t-statistics. The theoretical situation was established based on SEM model on the knowledge and perception analysis of cervical cancer among educated women was used as a base for the study (Fig. 1). With a general review of knowledge and perception analysis of cervical cancer among educated women, structural equation model using element based PLS path modeling was built by setting up six hypotheses with 24 attributes for results purpose.

H1 – There is a positive and significant relationship between knowledge about symptoms and risk factors and knowledge and perception analysis of cervical cancer.
H2 – There is a positive and significant relationship between knowledge about HPV and knowledge and perception analysis of cervical cancer.
H3 – There is a positive and significant relationship between knowledge about screening and vaccination and knowledge and perception analysis of cervical cancer.
H4 – There is a positive and significant relationship between health seeking behavior and knowledge and perception analysis of cervical cancer.
H5 – There is a positive and significant relationship between concern about obstacles and knowledge and perception analysis of cervical cancer.
H6 – There is a positive and significant relationship perception about cervical cancer and knowledge and perception analysis of cervical cancer.

Results and discussion

Knowledge and perception analysis of cervical cancer among educated women of sample questionnaire were prepared and distributed to the sample respondents. Out of 550 issued questionnaires, 521 (94.7%) were responded and 29 of them were considered not suitable for the study because of incomplete or blanked questionnaires. Thus, only 521 answered questionnaires was used for the current research. The knowledge and perception analysis of cervical cancer among educated women respondents was presented in Table 2.

*Corresponding author

Table 2. Demographic profile of the study participants.

Demographic profile	N=521	Frequency	Percentage (%)
Age	30 to 35 years	157	30.13
	35 to 40 years	162	31.10
	40 to 45 years	147	28.21
	Above 45 years	55	10.56
Education level	Graduation	418	80.24
	Post-graduation	24	4.60
	Others	79	15.16
Type of occupation	Private	77	14.78
	Government	235	45.11
	Self Employed	110	21.11
	Home makers	99	19.00
Income level	Below 10k	109	20.92
	10 to 20k	125	23.99
	20 to 30k	103	19.77
	Above 30k	184	35.32

Source: Primary data.

Fig. 2. The result of path analysis.

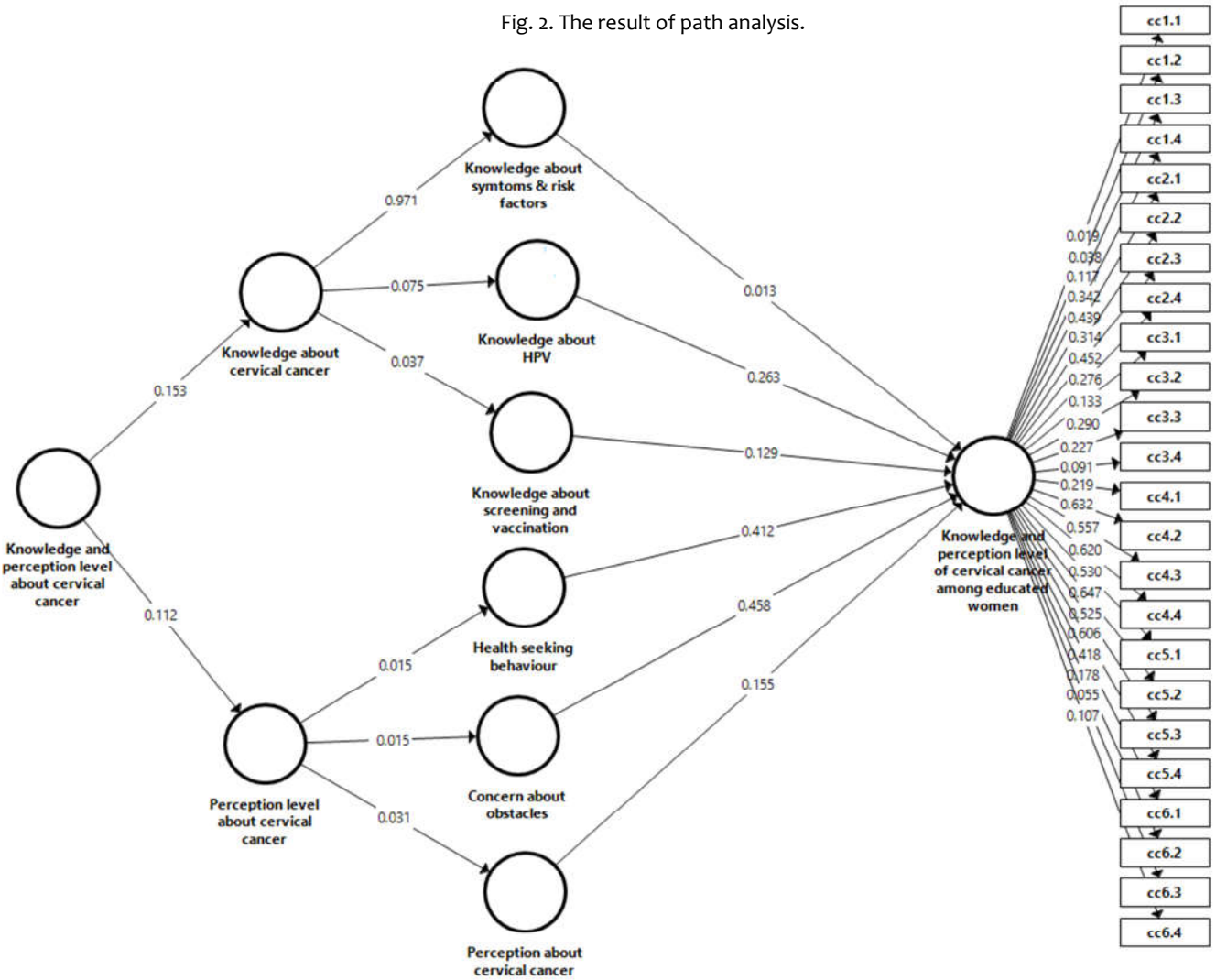


Table 3. Path coefficients (knowledge and perception analysis of cervical cancer).

Path coefficients	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T Statistics (|O/STDEV|)	P values
Knowledge about symptoms -> KPCC	0.458	0.455	0.020	23.053	0.000
Knowledge about HPV -> KPCC	0.412	0.409	0.019	21.583	0.000
Knowledge about screening and vaccination -> KPCC	0.263	0.461	0.022	12.051	0.000
Health seeking behavior -> KPCC	0.971	0.969	0.007	14.341	0.000
Concern about obstacles -> KPCC	0.429	0.530	0.022	5.861	0.000
Perception about cervical cancer -> KPCC	0.312	0.514	0.019	2.883	0.000

Source: Output from Smart PLS. Notes: p-values: ** = < 0.01, * =< 0.05.

Table 4. Assessment of the convergent validity of constructs.

Constructs	Items	Item loading	Cronbach's α	Composite reliability	AVE	R^2	R^2 adjusted
Knowledge about symptoms -> KPCC	6	0.712-0.769	0.825	0.780	0.771		
Knowledge about HPV -> KPCC	6	0.729-0.793	0.770	0.753	0.758		
Knowledge about screening and vaccination -> KPCC	6	0.732-0.790	0.715	0.789	0.763		
Knowledge and perception level of cervical cancer among educated women	24	0.754-0.812	0.787	0.847	0.649	0.842	0.897
Health seeking behavior -> KPCC	6	0.765-0.834	0.739	0.764	0.592		
Concern about obstacles -> KPCC	6	0.714-0.791	0.724	0.713	0.713		
Perception about cervical cancer -> KPCC	6	0.761-0.880	0.860	0.794	0.699		

Source: Author. Note: AVE = average variance extracted.

Table 5. Assessment of the discriminant validity of constructs.

Construct	KAS	KHPV	KSV	HSB	CAO	PCC
Knowledge about symptoms	0.685					
Knowledge about HPV	0.688	0.625				
Knowledge about screening and vaccination	0.681	0.681	0.674			
Health seeking behavior	0.729	0.790	0.630	0.753		
Concern about obstacles	0.750	0.576	0586	0.719	0.643	

Source: Author; Diagonal value: Square root of AVE, non-diagonal value: Correlation; KAS-knowledge about symptoms, KHPV-knowledge HPV, KSV-knowledge about screening and vaccination, HSB-health seeking behavior, CAO-concern about obstacles, PCC-perception about cervical cancer.

The path coefficients showed that, knowledge about symptoms (t=23.053, P=0.000), HPV (t=21.583, P=0.000), screening and vaccination (t=12.051, P=0.000), health seeking behavior (t=14.341, P=0.000), concern about obstacles (t=5.861, P=0.000), perception about cervical cancer (t=2.883, P=0.000), have positive significant impacts towards knowledge and perception analysis of cervical cancer at 0.01 significance level (Table 3). Hence, H1, H2, H3, H4, H5 and H6 are supported by the result. It was found to be positive. The R^2 values in the endogenous latent variable in the structural model showed a development perspective which explained 84.2% and R^2 adjusted explained as 89.7% of variance in knowledge about symptoms, HPV, screening and vaccination, health seeking behavior, concern about obstacles, and perception about cervical cancer.

Reflective Measurement Model: The aim of evaluating the reflective measurement model was to observe the adequacy of measures which was to access and whether the items are in association with direct reliability and validity in the specified data. This model measured the following variables such as convergent validity, discriminant validity, and reliability for reflective measurement. Convergent validity was measured to check the items determining the same in the specified data. Measuring convergent validity were, factor loadings, average variance extracted (AVE), and composite reliability. Loadings of all the items should exceed the value of 0.5 as suggested by Hair *et al.* (2011) (Table 4). AVE should be >0.5 as suggested by Barclay *et al.* (1995).

*Corresponding author

Table 6. Assessment of Structural Model.

Hypothesis	Relationship	Standard beta	Standard error	t-value	Decision
H1	Knowledge about symptoms -> KPCC	0.748	0.024	23.053	Supported*
H2	Knowledge about HPV -> KPCC	0.794	0.022	21.583	Supported*
H3	Knowledge about screening and vaccination -> KPCC	0.824	0.026	12.051	Supported*
H4	Health seeking behavior -> KPCC	0.821	0.018	14.341	Supported*
H5	Concern about obstacles -> KPCC	0.759	0.020	5.861	Supported*
H6	Perception about cervical cancer -> KPCC	0.775	0.019	2.883	Supported*

Source: Author. *P<0.05.

Table 7. Assessment of development perspective of the knowledge and perception analysis of cervical cancer effect relationship.

Hypothesis	Indirect effect			Standard error	t-value	Bootstrapped confidence interval	
	Path a	Path b	a*b			95% lower limit	95% upper limit
H6	0.857	0.726	0.622	0.005	2.883*	0.654	0.798

Source: Author. *p<0.05.

AVE measures the variance captured to measurement error by the indicators relative to validate using a construct. A value of AVE exceeding 0.5 validates that more than 50% of the variance of the construct was due to its indicators as per the analysis. Results showed that the AVE was between 0.592 and 0.771. The CR values were between 0.713 and 0.847, at >0.7 as suggested by Fornell and Larcker (1981). All items had adequate reliability assessment scores as specified by the CR values. The following step was to estimate the discriminant validity of constructs; the extent that items was defining various concepts as suggested by Garver and Mentzer (1999). Discriminant validity could be measured by comparing the square root of all AVE for each construct were specified in the data. So, that they exceeded all the inter-factor correlations between each construct of the variable quantified. Table 5 indicated that the measurement model has suitable level of discriminant validity. It is known from the values of the square root of all AVE values for each construct that exceeded all the inter-factor correlations between each and other construct. It can be used more for testing the structural model and given that all items have suitable validity and reliability. Table 6 exhibited that the relational norms showed a strong positive influence on relationship towards knowledge about symptoms results from the structural model (β=0.748, t-value=23.053, P<0.05), relationship on knowledge about HPV showed a strong positive influence (β=0.794, t-value=21.5834.447, P<0.05), relationship on knowledge about screening and vaccination showed a strong positive influence (β=0.824, t-value=12.051, P<0.05), relationship on health seeking behavior showed a strong positive influence (β=0.821, t-value=14.341, P<0.05), relationship on concern about obstacles showed a strong positive influence (β=0.759, t-value=5.861, P<0.05), relationship on perception about cervical showed a strong positive influence (β=0.775, t-value=2.883, P<0.05).

Thus, the results find that, support for H1, H2, H3, H4, H5 and H6 relational norms have significant influence on the knowledge and perception level of cervical cancer among educated women. Table 7 shows that the bootstrapped estimate of the indirect effect anticipated to lie between 0.726 and 0.857 with 95% confidence level. Because zero was not in the 95% confidence interval, it could be determined that the indirect effect was indeed expressively different from zero at P<0.05 as suggested by Preacher and Hayes (2004). Thus, hypothesis H6 is supported, in which relationship self-confidence mediates the link between on the knowledge and perception analysis of cervical cancer. The value of variance accounted for 65.4% indicates that relationship on knowledge and perception analysis of cervical cancer perspective is a partial intervention as recommended by Hair *et al.* (2014). This study observed that the relationship between the key elements of educated women and its impact on the knowledge and perception analysis of cervical cancer based on the other related literatures has confirmed that, significantly and it focuses on the awareness level of the cervical cancer among educated women. It can be concluded that improved the knowledge and perception level of educated women in knowledge about symptoms, HPV, screening and vaccination, health seeking behavior, concern about obstacles and perception about cervical cancer to handle the complications in continual way and willing to solve the problems of cervical cancer on time to ensure to improve life of educated women.

Conclusion

The present study suggests that the educated women from urban areas have knowledge on symptoms, risk factors, HPV, screening importance and vaccination availability and have fair concern about health seeking behavior and know how to be perceive about cervical cancer burden and

*Corresponding author

importance of screening in adults and role of vaccination in young women to protect from HPV infections and have positive attitude to disseminate the cervical cancer knowledge to reduce the cancer burden. The study concluded that the educated respondents from South-East India showed positive relationship of knowledge on perception of cervical cancer and has strength to face the obstacles and is stakeholders to reduce the cervical cancer burden and improve their life. The majority of the selected cities from South-East India population represent cosmopolitan educated and working women has motivation attainment, leadership skill, self confidence level, decision making skill and so on, and it is natural to have awareness about health. It is suggested that, awareness camps should be organized to make awareness about cervical cancer, so not only the urban population, other categories of society will well aware about cervical cancer preventive strategies and reduction in cervical cancer burden. The results of this study cannot be comprehensive with the entire South East Indian population. Though all the projected hypothesis were based on previous research studies and indications shown in the previous literature, it is not possible to explain ultimate relationships among the development perceptive of the study due to the absence of a longitudinal research design. Several problems linked with the time constraints and costs are involved in this research. The sample was drawn from the selected cities; this study may be limited in its broad-spectrum of the results to other areas of entire states in India. The sample of the present research involved development perspective of urban educated women and excludes the other rural population. Future research should essence on a higher sample size and all types of women which could be true representative of South-East India.

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***Corresponding author**