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## Utilization of cervical cancer screening program and its predictors in the universal health coverage era in Badung District, Bali

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### ABSTRACT

**Background and purpose:** Cervical cancer is the second most prevalent cancer in women after breast cancer. Nationally, the coverage of cervical cancer screening among reproductive age women from 2014 to 2018 only reached 7.34%, while in Badung District was 10.3% in 2018. In the era of the Universal Health Coverage (UHC) schemes, cervical cancer screening has been covered. This study aims to explore factors associated with the utilization of cervical cancer screening programs in the UHC era in Badung District.

**Methods:** This cross-sectional study was conducted from January-February 2020, involving 195 women aged 20-50 years who were selected through multistage random sampling from two villages in the Badung District. Characteristics of the women, perceptions of seriousness, vulnerability, barriers and benefits, self-efficacy, cues to action and knowledge on cervical cancer screening programs were assessed. Data was analyzed descriptively, and association was assessed with Chi square and multiple logistic regression.

**Results:** The proportion of reproductive age women who utilized cervical cancer screening program in the last 5 years was 44.1%. The utilization of cervical cancer screening program was associated with age (AOR=0.03; 95%CI: 0.03-0.300), perceived vulnerability (AOR=28.77; 95%CI: 3.745-221.68), perceived barriers (AOR=55.70; 95%CI: 7.12-435.72), self-efficacy (AOR=34.44; 95%CI: 4.34-273.66), cues to action (AOR=19.56; 95%CI: 3.32-115.24).

**Conclusion:** The perception of barriers was found to be significantly associated with the use of cervical cancer screening programs along with other variables related to the Health Belief Model (HBM). Structured campaigns and improvement of the quality of services should be carried out in order to increase access of women to cervical cancer screening.

**Keywords:** screening, cervical cancer, universal health coverage, Health Belief Model

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### INTRODUCTION

Cervical cancer is a major health concern for women globally. Cervical cancer has the second highest incidence of cancer in women after breast cancer.<sup>1</sup> Based on data from the International Agency for Research on Cancer (IARC), every year more than 300,000 women die from cervical cancer. In developing countries, every minute there is a woman diagnosed with cervical cancer, and 9 out of 10 women who die are found at an advanced stage.<sup>2</sup> In line with global trend, in Indonesia, the prevalence of cervical cancer has increased in the last five years. Data from the Indonesian Ministry of

Health (MoH) at the beginning of 2019 shows that the prevalence of cervical cancer cases reached 23.4 per 100,000 population with a mortality rate of 13.9 per 100,000 population.<sup>3</sup> Most of cervical cancer patients (80%) came to health services at an advanced stage wherein 94% of these cases died within two years.<sup>4</sup>

According to World Health Organization (WHO) guidance, an organized and routine screening program is an essential prevention and control for cervical cancer. There are two types of screening available, the pap smear examination and visual inspection with acetic acid (*inspeksi visual*

*dengan asam asetat/IVA*). Pap smear is a cytopathological examination to determine abnormal changes in cervical epithelial cells that can be found in cancerous or pre-cancerous conditions. Pap smear is able to detect cervical cancer by finding premalignant and malignant processes in ectocervix and endocervix infection with a specificity of 90%-95% and an accuracy of up to 90%. The IVA test is an examination with a speculum, by applying acetic acid (3-5%), a cervical precancerous lesions is suspected when the results show white patches/acetowhite epithelium. IVA has a specificity of 64%-98%, a positive predictive value of 10%-

20% and an accuracy of 85%. While pap smear has a better accuracy, the advantages of the IVA test that it can be performed at public health centers setting and the results of the examination can be seen directly which should then referred for follow up test.<sup>4</sup>

To reduce the rate of cervical cancer in Indonesia, since 2015, a national cervical cancer screening program has been rolled out.<sup>5</sup> The MoH targeted 50% of women aged 30-50 years should receive cervical cancer screening services in 2019.<sup>5</sup> This target is in line with the support of the National Health Insurance program (*Jaminan Kesehatan Nasional/ JKN*) on cancer prevention and control programs by covering the screening test. However, the national coverage of cervical cancer screening from 2014 to 2018 only reached 7.34% women of reproductive age accounted for 2,747,662 women. This indicates that this program is far behind the national target, and utilization of cervical cancer screening among that women of reproductive age are low despite under the UHC program.<sup>5-7</sup> This situation has also occurred in Badung District, Bali wherein despite high uptake to the Universal Health Coverage program, only 10.3% of reproductive age women have utilized cervical cancer screening services.<sup>8</sup> The lowest cervical cancer screening coverage in Badung District in 2018 was in the Mengwi II Public Health Center (PHC) working area, at 13%.<sup>8</sup>

Coverage and uptake of women who screen for cervical cancer can be influenced by perception and behavior.<sup>9-12</sup> This is in line with the concept of the Health Belief Model (HBM). In the HBM concept, someone will behave in a positive way by taking action to prevent a disease based on beliefs and perceptions about the disease.<sup>13</sup> In the context of cervical cancer prevention, reproductive age women will conduct a search for health services, especially screening to improve their health status.<sup>14,15</sup> In addition to the level of knowledge and income which is also influence the behavior in accessing cervical cancer screening,<sup>16,17</sup> factors related to HBM theory such as cues to action, perceived barriers, perceptions of vulnerability, severity, threats and perceived benefits also influence as

indicated in previous studies.<sup>18</sup>

Although there have been studies showing that knowledge and a number of factors related to HBM have an impact upon screening coverage in reproductive age women, these studies also found that perceived financial burden as a barrier to access.<sup>17,18</sup> In Badung District where the entire population has received health insurance, including coverage for cervical cancer screening, cost to individual should no longer be a deterrent. Therefore, it is important to assess which factors related to knowledge and HBM affect cervical cancer screening uptake among women in the Badung District who are covered by the Universal Health Coverage (UHC) scheme. This study aims to determine the utilization of cervical cancer screening and its predictors according to HBM concept in Badung District in 2020.

## METHODS

This was a cross sectional survey conducted in the working area of the Mengwi II PHC, Badung District in January 2020. Mengwi II PHC was selected because it has the lowest coverage (13%) of cervical cancer screening in Badung District in 2018. The target population in this study were reproductive age women in Badung District. Meanwhile, the assessable population in this study were reproductive age women in the working area of Mengwi II PHC in January 2020, with inclusion criteria, being married, having a JKN (*Jaminan Kesehatan Nasional/ KJS*) (*Krama Badung Sehat*) card, living in Badung District, and willing to become respondents.

The sample size in this study was calculated based on estimation of two population proportion formula (below) with the significance level of 95%, and the research power was 90%, which resulted in 195 minimum sample size.

$$n = \frac{\{z_{1-\alpha/2}\sqrt{2P(1-P)} + z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\}^2}{(P_1 - P_2)^2}$$

P1 was the proportion of reproductive age women who utilized the cervical cancer screening program with a high perception of vulnerability of 67% (0.67), while P2 was the proportion of reproductive age women who utilized the cervical cancer

screening program with low perception of vulnerability at 39% (0.39).<sup>18</sup>

The selection of respondents was carried out through multistage sampling. We first selected one village to represent rural and one neighborhood (*kelurahan*) to represent urban area; then proportionately based on size and number of sub-villages; one sub-village (*banjar*) was selected from the rural and three *banjar* from the urban area. The next step was calculating the number of samples selected in each of four *banjar* proportionately based on total number of reproductive age women. Then, in each *banjar*, sample was selected using simple random sampling based on the list of reproductive age women that serve as the sampling frame.

The data included characteristics of the respondent, the perceptions of vulnerability, seriousness, benefits, barriers, self-efficacy, cues to action and knowledge on cervical cancer screening programs. Data was collected with modified questionnaire<sup>18</sup> that was tested for validity and reliability by lead author. The score for each question was added up in sections, it scored 1 if “Strongly Disagree (SD)”, scored 2 if “Disagree (D)”, scored 3 if “Agree (A)” and scored 4 if “Strongly Agree (SA)”, then, the total score for each section is obtained, namely the total perceived vulnerability score, the total perceived severity score and the total perceived benefit score. In contrast, for the perception of barriers, opposite scoring was applied. The total scores for perceptions of susceptibility, severity, barriers, and benefits were grouped into two, namely “high” and “low” with median as the cut-off-point. Similar for self-efficacy and cues to action scores were grouped into two, namely “high” and “low” based on the median score.

The knowledge level of women was measured by ten statements covering the definition of cervical cancer, cervical cancer risk factors and cervical cancer prevention and screening methods. Each statement consisted of two answer choices, namely “correct” and “incorrect”. The “correct” answer option was given a score of one and “incorrect” was allocated a score of zero. The scores for each statement were added to obtain a total score of knowledge, then into three, namely “good”, “fair” and

“poor” with a cut-off-point mean value of the total score.

Univariate analysis was carried out, for numerical variables, the mean, standard deviation, minimum and maximum values were calculated; while, for categorical variables the frequency distribution and proportion of each categories were presented. This analysis was also carried out on the dependent variable consisting of utilization of cervical cancer screening program by women of reproductive age.

This was followed by bivariate analysis, which consisted of comparison analysis for the difference in proportions by comparing the cross distribution between the independent variable and the dependent variable using the Chi Square test. Multivariate analysis with multiple logistic regression was conducted with a confidence level of 95%. Data analysis was conducted using the SPSS application.

This research has obtained an Ethics Clearance from the Ethics Committee of the Faculty of Medicine, Udayana University/Sanglah Hospital Denpasar with Number: 116/UN14.2.2.VII.14/LP/2020.

## RESULTS

The characteristics of 195 reproductive age women participated in the study are presented in Table 1. The average age of respondents was 34.71±7.916 years, with the most prevalent level of education is high school (35.9%). Almost half of the respondents are housewives (47.2%) with an average income of IDR 2,511,650.49±123,497.491; 95%CI: 1,108,682.14-1,544,651.19).

In Table 2, it was reported that respondents who used screening services, most (82.6%) stated that they did not routinely attend the services and based on the type of screening, most (40.0%) respondents have went through the pap smear test. More than half (54.7%) of the respondents screened at the public health center, and as much as 40.7% with the *Gebayar* funding (mass free early detection of cervical cancer by the Badung government). From the experience of went through screening, 17.4% of respondents said they were not satisfied with the services provided.

**Table 1. Socio-demographic characteristics of reproductive age women and utilization of cervical cancer screening program in the UHC era**

Characteristic	f (%)
Age	
Min; Max	20; 49
Mean	34.71 (7.916)
Level of education	
Elementary	48 (24.6)
High school	93 (47.7)
Tertiary	54 (27.7)
Employment	
Laborer	1 (0.5)
Teacher	5 (2.6)
Farmer	1 (0.5)
Public servant	10 (5.1)
Business	58 (29.7)
Private business	28 (14.4)
House duties	92 (47.2)
Income	
Min; Max	0; 9.000.000
Mean	1,326,666.67 (1,543,395.195)
Utilizations of cervical cancer screening	
Not utilized	109 (55.9)
Utilized	86 (44.1)

**Table 2. Utilizations of cervical cancer screening by reproductive age women in Badung**

Characteristic (n=86)	f (%)
Regularly conduct cervical cancer screening	
Yes	15 (17.4)
No	71 (82.6)
Type of test	
IVA test	7 (8.1)
Pap smear test	78 (40.0)
Cervical scan	1 (0.5)
Service provider (n=86)	
PHC	47 (54.7)
General Practitioner	19 (22.1)
Midwife	4 (4.7)
Clinic	5 (5.8)
Hospital	11 (12.8)
Payment for services	
Husband	18 (20.9)
BPJS/KIS/KBS/UHC	31 (36.0)
<i>Gebayar</i>	35 (40.7)
Private health insurance	2 (2.3)
Level of satisfaction	
Unsatisfied	15 (17.4)
Satisfied	69 (80.2)
Very satisfied	2 (2.3)

**Table 3. Perception, self-efficacy, cues to action, and knowledge on cervical cancer screening program utilization in Badung**

Variable		n (195)	%
Perception of vulnerability	Median score (min-max)	4 (2-7)	
	Low ( $\leq$ median)	106	54.4
	High	89	45.6
Perception of seriousness	Median score (min-max)	22 (13-30)	
	Low ( $\leq$ median)	119	61.0
	High	76	39.0
Perception of benefits	Median score (min-max)	16 (5-20)	
	Low ( $\leq$ median)	115	59.0
	High	80	41.0
Perception of inhibition	Median score (min-max)	14 (7-21)	
	Low ( $\leq$ median)	98	50.3
	High	97	49.7
Self-efficacy (n=195)	Median score (min-max)	8 (7-16)	
	Low ( $\leq$ median)	99	50.8
	High	96	49.2
Cues to action (n=195)	Median score (min-max)	8 (7-13)	
	Low ( $\leq$ median)	106	54.4
	High	89	45.6
Knowledge levels (n=195)	Median score (min-max)	80 (50-100)	
	Poor	0	0
	Fair	69	35.4
	Good	126	64.6

**Table 4. Utilization of the cervical cancer screening program based on socio-demographic characteristics, perception, self-efficacy, cues to action and knowledge of women of reproductive age**

Variable	Screening Benefits				p
	Not Beneficial		Beneficial		
	n	%	n	%	
<b>Age</b>					
20-29 (n=65)	19	29.2	46	70.8	0.00*
30-50 (n=130)	90	69.2	40	30.8	
<b>Level of education</b>					
Elementary/High school (n=141)	84	59.6	57	40.4	0.095
Tertiary (n=54)	25	46.3	29	53.7	
<b>Employment</b>					
Unemployed (n=92)	55	59.8	37	40.2	0.302
Employed (n=103)	54	52.4	49	47.6	
<b>Income</b>					
<Minimum wage (n=158)	90	57.0	68	43.0	0.536
$\geq$ Minimum wage (n=37)	19	51.4	18	48.6	
<b>Perception of susceptibility</b>					
Low (n=106)	85	80.2	21	19.8	<0.001*
High (n=89)	24	27.0	65	73.0	
<b>Perception of seriousness</b>					
Low (n=119)	56	47.1	63	52.9	0.002*
High (n=76)	53	69.7	23	30.3	
<b>Perception of benefits</b>					
Low (n=115)	67	58.3	48	41.7	0.425
High (n=80)	42	52.5	38	47.5	
<b>Perception of barriers</b>					
Low (n=98)	22	22.7	75	77.3	0.00*
High (n=97)	87	88.8	11	11.2	
<b>Self-efficacy</b>					
Low (n=99)	89	89.9	10	10.1	0.00*
High (n=96)	20	20.8	76	79.2	
<b>Cues to action</b>					
Low (n=106)	93	87.7	13	12.3	0.00*
High (n=89)	16	18.0	73	82.0	
<b>Knowledge levels</b>					
Poor (n=0)	0	0	0	0	0.00*
Fair (n=69)	61	88.4	8	11.6	
Good (n=126)	48	38.1	78	61.9	

The perceptions of reproductive age women, self-efficacy, cues to action and knowledge of the utilization of the cervical cancer screening program are presented in Table 3. More than half (54.4%) of the respondents had low perceptions on their vulnerability. Low perceptions were also found in the aspects of seriousness (61.0%), benefits (59.0%), and barriers (50.3%). Most of the respondents have low self-efficacy (50.8%) and low cues to action (54.4%). Meanwhile, most respondents have good knowledge levels (64.6%).

Table 4 indicates that the proportion of respondents aged 20-29 years (70.8%) who used the cervical cancer screening program in the UHC era was higher than respondents aged 30-50 years. A higher proportion of respondents with a high level of education (53.7%) and an income above average wage (48.6%) took advantage of the cervical cancer screening program during the UHC era. The proportion of the use of cervical cancer screening programs in the UHC era was higher in women with high perceived susceptibility compared to those with low perceived susceptibility (73% vs 19.8%), perception of low seriousness compared to high seriousness (52.9% vs 30.3%) and perceptions of low barriers compared to high barriers (77.3% vs 11.2%). The proportion of utilization of cervical cancer screening programs in the UHC era was higher among women with high self-confidence compared to those with low self-confidence (79.2% vs 10.1%) and high cues to action compared to low cues to action (82% vs 12.3%). Utilization of the cervical cancer screening program in the UHC era was highest among well-informed women (61.9%), followed by moderately informed (11.6%). In the bivariate analysis, there are eight main variables which are then included in the multivariate model, namely the socio-demographic (age and education), perception of susceptibility, seriousness and barriers, self-efficacy, cues to action and knowledge.

Table 5 shows that there were five independent variables found to be associated with the use of the cervical cancer screening program in the UHC era, namely age, perception of susceptibility and barriers, self-efficacy and cues to action ( $p < 0.05$ ). Perceived susceptibility,

**Table 5. Factors associated with utilization of the cervical cancer screening program in the UHC era**

Variable	Multivariate Analysis	
	AOR (95%CI)	p
<b>Age</b>		
20-29	Ref	
30-50	0.028 (0.003-0.300)	0.003*
<b>Level of education</b>		
Elementary	Ref	
High School	0.627 (0.083-4.726)	0.651
<b>Perception of susceptibility</b>		
Low	Ref	
High	28.774 (3.735-221683)	0.001*
<b>Perception of seriousness</b>		
Low	Ref	
High	1.084 (0.160-7.351)	0.943
<b>Perception of barriers</b>		
High	Ref	
Low	55.701 (7.121-435.720)	0.000*
<b>Self-efficacy</b>		
Low	Ref	
High	34.441 (4.343-273.116)	0.001*
<b>Cues to action</b>		
Low	Ref	
High	19.561 (3.321-115.237)	0.001*
<b>Knowledge levels</b>		
Fair	Ref	
Good	5.883 (0.780-44.393)	0.086

perceived barriers, self-efficacy and cues to action increase the likelihood of cervical cancer screening utilization in the UHC era (AOR>1), while older age seem to have lower likelihood to utilize the services (AOR=0.028; 95%CI: 0.003-0.300). The variable with the highest OR value in the use of cervical cancer screening programs in the UHC era was perceived barrier, low perceived barrier increases the chance of utilizing cervical cancer screening programs compared to those with high perceived barrier (AOR=55.701; 95%CI: 7,121-435,720).

## DISCUSSION

This study found that only half (55.9%) of reproductive age women take advantage of the cervical cancer screening program in Badung District. Among those who utilized it, only 17.4% routinely attended the screening. The most common form of screening was pap smear and more than half was performed at PHCs (54.7%) with *Gebayar* financing (40%).

Regarding demographic characteristics, this study found that women aged 30-50 years were less likely to attend cervical cancer screening programs during the UHC era compared to women aged 20-29 years. These results are in line with a research among women of reproductive age in Tabanan District but are not consistent with the findings of Titisari et al (2018) which found that the age variable was not related to the participation of women in IVA examinations.<sup>9</sup> Younger women may be exposed to more information on screening program during their final year of schooling since there was a cervical cancer vaccination program for high school female student in Badung District. Therefore, specified media campaign should be developed to target certain group of women to scale up screening participation. Approach to women group in the community could be an entry point to reach the older age group women.

We found low perceived barriers and

the perception of high susceptibility increase the likelihood of a reproductive age women to utilize the cervical cancer screening program. This result is also in line with previous research at Lubuk Buaya PHC and a study in North Ethiopia which revealed that significant predictors in cervical cancer screening services include perceptions of susceptibility to cervical cancer and perceived barriers to cervical cancer screening.<sup>10,11</sup> Different with research in Saudi Arabia, of all HBM components, only the perception of barriers has a significant effect on the use of cervical cancer screening.<sup>12</sup> In accordance with the HBM theory, it is stated that perceived susceptibility and barriers are variables which have the power to influence a person to perform certain health behaviors. High perceived susceptibility to a disease and low perception of barriers will lead to positive attitudes on health behavior.<sup>13</sup>

Furthermore, the results of this study also found that women with high self-efficacy and high cues to action had a greater chance of utilizing cervical cancer screening programs in the UHC era. This is consistent with the results of research on women at the Kediri City PHC regarding self-efficacy.<sup>14</sup> Belief in self-efficacy is based on the self-confidence possessed by women. Self-efficacy is key to changing health behavior.<sup>19</sup> The level of self-confidence of each individual varies greatly, this is influenced by culture, individual traits, gender, individual roles in the social environment and information about self-efficacy, and direct and indirect experiences.<sup>20</sup> Regarding cues to action, the results of this study are consistent with research by Wigati (2016)<sup>14</sup> wherein if women experience a decrease in cues to action, the IVA testing behavior will also decrease.

However, this study did not find a significant relationship between education, employment and income with the utilization of cervical cancer screening programs in the UHC era. These results are consistent with research at Padang Pasir and Sukawati II PHCs.<sup>15,16</sup> In addition, this study also did not find a significant relationship between knowledge, perceptions of seriousness and benefits with the use of cervical cancer screening

programs during the UHC era. This insignificant result is consistent with the study conducted by Aprianti (2017).<sup>17,21</sup> Although none of the women in our study had low level of knowledge, nevertheless, there are women with high knowledge levels who did not utilize cervical cancer screening program. Despite relatively good knowledge on cervical cancer screening program, it seems that it has not translated into supportive perception which lead to positive action toward utilization of cancer screening program among reproductive age women. Health workers should leverage education campaign to improve positive perception toward the program. Structured campaigns and the improvement of screening service's quality should also be considered to enhance satisfaction of the women to the service.

This research subject to some limitations. Information bias may occur because it depends on respondents' memories in remembering when they have used cervical cancer screening programs which should be able to be minimized by checking their cervical cancer screening attendance card, however not all women had the card. The enumerator made sure the respondent had answered all the questions completely when the respondent finished filling out the questionnaire to reduce missing information.

## CONCLUSION

Utilization of the cervical cancer screening program in the UHC era in Badung District was remaining low despite the cost of the screening was covered by insurance. Perceived susceptibility, self-efficacy and cues to action are positively associated with the use of cervical cancer screening programs, while perceived barrier is negatively associated with the utilization. Therefore, it is essential to reduce barriers perceived by the reproductive age women to attend the screening program. Routine promotion and structured campaigns involving local women groups should be conducted to not only improve awareness but to also build positive perception on the importance of screening especially among the older age women who are actually at higher risk of experiencing cervical cancer. Health services providers should also improve the service quality

and competence to provide optimal care and services.

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## AUTHOR CONTRIBUTION

AW conducted research, analyzed data and drafted manuscripts. PJ and CWS provided input on research proposals and in the preparation of manuscripts.

## CONFLICT OF INTEREST:

There is no conflict of interest declared by the authors.

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