Fear of COVID-19 as mediator in the relationship between at-risk Filipino women's health belief and intention to have pap smear test

Honey Grace T. Romarate-Abella*[1,2], Jonathan D. Cura[1,3]

[1] School of Nursing and Allied Medical Sciences, Holy Angel University, Angeles City, Philippines
[2] Hospital Infection Prevention & Control Unit (HIPCU), OFW Hospital, City of San Fernando, Pampanga, Philippines
[3] Queen Elizabeth Scholar, McMaster Health Forum, McMaster University, Ontario, Canada

ABSTRACT

Despite being one of the most preventable and curable types of cancer, cervical cancer still causes death among Filipino women yearly. The pandemic created new obstacles for women to overcome, but some of the obstacles that existed before COVID-19 may now be worsened and will seriously affect women's self-care management, limiting their access to the necessary procedures needed for the screening of cervical cancer. This study aimed to determine the relationship of at-risk Filipino women's health beliefs towards their intention to have Pap Smear test and the mediating role of fear of COVID-19. A causal predictive approach was conducted and 572 female Filipino currently residing in the Philippines participated in the study. Data were gathered utilizing the Health Belief Model Scale for Cervical Cancer and the Pap Smear Test and the Fear of COVID-19 Scale with the Intention to Screen assessed by a structured question. With p-values of $< .05$ which is considered statistically significant in this study, the outcome of the mediation analysis shows that the mediated effect of fear of COVID-19 is not particularly (partial mediation) significant. There is still a significant direct association between health beliefs particularly on the benefits of Pap Smear test and health motivation and barriers to Pap Smear test with the intention to screen even without the presence of fear. In conclusion, the fear of COVID-19 plays a minor effect in the association between Filipino women's health beliefs and their intention to attend Pap smear testing.

Key Words: Health belief model, Cervical cancer, Pap smear test, Fear of covid-19, At-risk Filipino women

1. INTRODUCTION

Cancer is a vast category of diseases that can practically begin in any organ or tissue of the body and spread to other organs when abnormal cells proliferate uncontrollably, invade adjacent regions of the body, and/or move to other organs (metastasizing) which is a leading cause of cancer-related death. Cancer is also known as a neoplasm or a malignant tumor.[1] It is the second biggest cause of death worldwide, accounting for 9.6 million fatalities in 2018, or one (1) in every six (6) deaths.[2] Cervical cancer (CC) is the 7th most common malignancy in women and the 9th most common cause of death for women of all ages worldwide with Asia having the highest occurrences of new cancer diagnoses and fatalities for both sexes, accounting for 49.3% (9,503,710 of total new cases) and a mortality rate of 58.3% (5,809,431 cases); statistically, breast cancer makes up to the top three

*Correspondence: Honey Grace T. Romarate-Abella; Email: hgabella.ofwh@gmail.com; Address: Hospital Infection Prevention & Control Unit (HIPCU), OFW Hospital, City of San Fernando, Pampanga, Philippines.

(3) of new cases with lung, colorectal and liver cancer as the leading cause of mortality, regardless of gender and age.[3] In the Philippines, there are 153,751 new cases for both sexes, with females accounting for 56.2% (86,484 cases) of the total cases and males accounting for 43.8% (67,267 cases). Breast cancer is the most common cancer in women, followed by cervix uteri, colorectal, lung, and ovarian cancer.[4] For the purposes of the present research paper, cervical cancer will be the emphasis.

Cervical cancer is the second most frequent malignancy and the top cause of cancer mortality in the Philippines, which is linked to the majority of patients receiving late-stage diagnoses and therapy that is either costly or unavailable.[5, 6] While the prevalence and fatalities of cervical cancer decrease in highly industrialized nations such as the United States and Europe, the incidence of cervical cancer in the Philippines remains high.[7] Despite being one of the most preventable and curable types of cancer,[8] cervical cancer still causes the death of women in the Philippines yearly; from the latest report, cervical cancer is the 6th most common kind of cancer and the sixth major cause of death among women ages 15 to 44.[4] HPV infection is responsible for nearly all occurrences of cervical cancer.[9]

Young-age first intercourse, low socioeconomic position, high parity, smoking, use of oral contraception, and hazardous sexual behaviors are all factors that enhance the risk of HPV infection and subsequent development of cervical cancer.[6] Cervical cancer can be prevented, and lives will be saved with regular screening.[10] The Pap Smear Test is currently the most widely used tool for detecting precancerous lesions across the world and is one of the most reliable and feasible methods of diagnosing early cervical cancer in the Philippines at present.[11, 12] However, barriers continue to prevent women from getting tested such as expenses, lack of symptoms, and fear of pain or discomfort and/or embarrassment during the cervical cancer screening process.[13] Fear of a cancer diagnosis is also a barrier to screening.[14, 15] In combination with the looming threat of Covid-19 pandemic, where there is a significant impact on how people intentionally avoid going to the hospital, this has resulted in disruptions of elective health services such as cervical screening, management of abnormal screening test results, and treatment of precancers.[16] The pandemic created new obstacles for women to overcome, but some of the obstacles that existed before COVID-19 may now be worsen.[17] This research study aimed to determine the relationship of at-risk Filipino women's belief towards their intention to have Pap smear test and the mediating role of Fear of COVID-19. The findings of this study can provide information that will support the promotion of early diagnosis and treatment of cervical cancer among at-risk Filipino women highlighting that despite the present coronavirus epidemic, it is critical to continue pursuing the strategy to eliminate cervical cancer; the momentum established from prior initiatives must be sustained and be able to reach the DOH's aim of a cervical cancer-free Philippines by 2040.[18]

Cervical cancer is one of the top causes of death among women diagnosing 604,127 women worldwide in 2020, with 341,831 women dying from the disease.[19] In already developed countries, the mortality rate associated with cervical cancer decreases significantly since many cases are detected early.[20] Cervical cancer incidence decreases in countries with well-established cervical cancer screening programs, with screening accounting for a significant percentage of the drop.[7] In the screening measures, sometimes in the form of basic tests, such as the Pap Smear test, are used during this period. When there is a positive detection of HPV infection or precancerous lesions during Pap smear screening, provisions of treatments are given therefore increasing the chance of a good cure rate.[8] However, WHO emphasizes that early detection of an illness does not always imply a benefit justifying that if early diagnosis and treatment do not result in a better health outcome, people will become more concerned and will receive therapy for longer periods of time unnecessarily. Hence, risk factors play an important role in balancing the need for screening.[21] Tobacco usage, multiple pregnancies, long-term hormonal contraception, and HIV co-infection are known cofactors contributing to cervical carcinogenesis in the Philippines.[5] WHO also includes HPV type according to its oncogenicity or cancer-causing strength, people who are immunocompromised, such as those living with HIV, parity (number of babies born) and first birth at young age, and tobacco smoking.[22] It is also critical to consider the age of women who will undergo cervical screening.[23] Screening around the age of 20 has minimal effect on identifying cancer, but it may cause harm by treating high-grade cervical lesions that may resolve over time, resulting in preterm birth and low birth weight.[24] Meanwhile, screening around the age of 30 may result in the missed detection of cervical intraepithelial neoplasia (CIN) lesions, which has the potential to develop into cervical cancer.[23] As a result, there is no universally agreed-upon age for cervical cancer screening. Instead, differing age recommendations were listed as follows: age 21,[25] 25 years of age;[26] and age of 30 in the general population.[11] The Philippine's Department of Health (DOH) currently recommends cervical cancer screening for women aged 25 to 55.[27] Identifying the risk factors linked to the development of cervical cancer combined with established screening intervals can help women participate in their own decision along with their personal beliefs about

the advantages and disadvantages of screening at varied ages, allowing them to make personal choices accordingly. Therefore, following the interruptions caused by the COVID-19 pandemic, risk-based measures seem to be the most effective approach for screening programs to recover.[28]

1.1 The health belief model

The Health Belief Model (HBM) is made up of several main components (or constructs) that predict whether or not people will take action to avoid, detect, or treat sickness.[29] HBM explains why so many individuals refuse to take part in a disease prevention and detection program.[30] It points out that individuals are likely to respond if they: strongly feel that they are particularly vulnerable to the condition (perceived susceptibility); strongly feel that the condition has significant impact (perceived severity); strongly feel that taking action would help decrease their vulnerability to the condition or its severity (perceived benefits); strongly feels that the risks of taking action (perceived barriers) are outweighed by the benefits; are presented with factors that motivate them to make changes (cue to action); and are optimistic in their capability to complete the activity successfully (self-efficacy). Perceived benefits and perceived barriers are the primary constructs determined to predict behavioral change on a long-term basis.[31] The model contends that if people believe there are significant barriers to adopting the preventative behavior, they will be less likely to do so. Likewise, the likelihood of acquiring a preventative health behavior increases when perceived benefits outnumber the reported barriers.[32]

1.2 Health beliefs and the intention to have pap smear test

Screening is a global health strategy used to prevent disease in people who are otherwise healthy with the goal to identify and recognize not only those who are unwell, but also those who are highly probable to have the disease or at-risk; fortunately, early detection and screening programs can help prevent cervical cancer.[33] Yet, even when circumstances where effective screening programs are available, women's lack of information and negative health-seeking behavior such as believing that the screening is insignificant to them, and that they have more immediate concerns to attend to, still choose not to participate, thus, resulting in low participation of such programs.[34, 35] Women who perceive more barriers in their access to the Pap Smear tests have a lower chance of getting the test and that the negative attitudes toward the test and health care services have an impact on their taking of screening.[36]
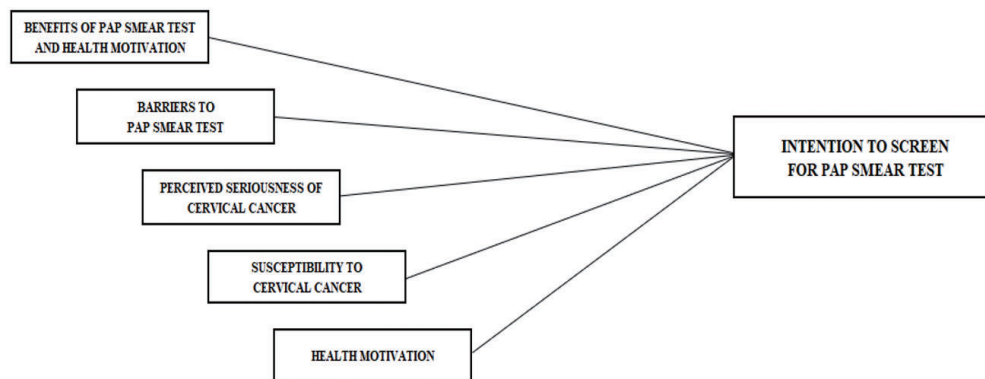

Figure 1. The direct effect of health beliefs on intention to have pap smear test

1.3 Health beliefs and fear of Covid-19

According to the HBM, at least three (3) factors influence the interpretation of an individual health behavior threat: overall health beliefs, specific health perceptions about susceptibility to a specific health threat; and beliefs about the implications of the health problem.[37] The basic premise of the model was that if people are aware of a serious health threat, believe they are personally at risk, and strongly believe that the risks of acting (perceive barriers) are outweighed by the benefits, they will do whatever it takes to reduce their chances. When WHO declares the outbreak a worldwide pandemic on March 11, 2020,[38] governments all around the world have heed to the call by enacting regulations to minimize transmission, resulting in some sort of lockdown in nearly every country were preventive measures such as early screening, diagnosis, isolation, and treatment are put in place. Due to the significant rise of infection in the number of people with the COVID-19 virus throughout the world, public fear and concern grows in many regions across the world.[39] A study involving the Health Belief Model and the adherence to COVID-19 precautionary measures also shows that perceived benefits of actions and incentives for participating in activities positively

connect with practicing effective hand hygiene, using a face mask, and social distancing.[40] This further emphasizes that those who believe they are susceptible, perceive a high risk of infection, and are frightened of the virus are more likely to participate in preventive behaviors, despite demographic differences.[41]
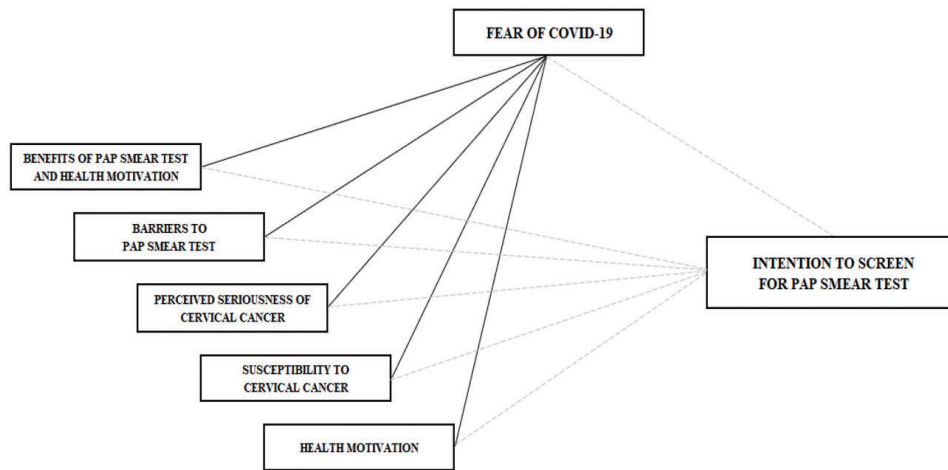

Figure 2. The direct effect of health beliefs on fear of Covid-19

1.4 Fear of Covid-19 and the intention to have pap smear test

COVID-19 has quickly become a pandemic, causing an increase in people's anxiety, panic, and fear as a result of their perceived threat of the virus.[42] For this reason, reduction in preventive care such as cancer screening is needed in order to conserve personal protective equipment and prevent infection transmission.[43] In comparison to the past 5-year estimates, the overall number of cancer screening tests received by women through the CDC's National Breast and Cervical Cancer Early Detection Program (Early Detection Program) decreases by 87% for breast cancer and 84% for cervical cancer.[44] From pre-COVID-19 patterns, further disruptions in cancer screening will significantly raise the number of cases of cancer in the general public.[43] A survey by one of the United Kingdom's leading cervical charities reveals that fear of COVID-19 is one of the reasons why women are not attending cervical cancer screening appointments and others believe that it is preferable to avoid cervical screening for the time being.[45] In the Philippines, a report from the Field Health Services Information System (FHSIS) sees a significant drop in the number and proportion of women aged 20 and up eligible for cervical cancer screening in 2019 and 2020.[46] This is evident by the fact that the Philippines, as one of the high-risk countries from the Wuhan coronavirus outbreak, reported the first case in January 2020, the first death outside China in February, and the first local transmission on March 7, 2020.[47]
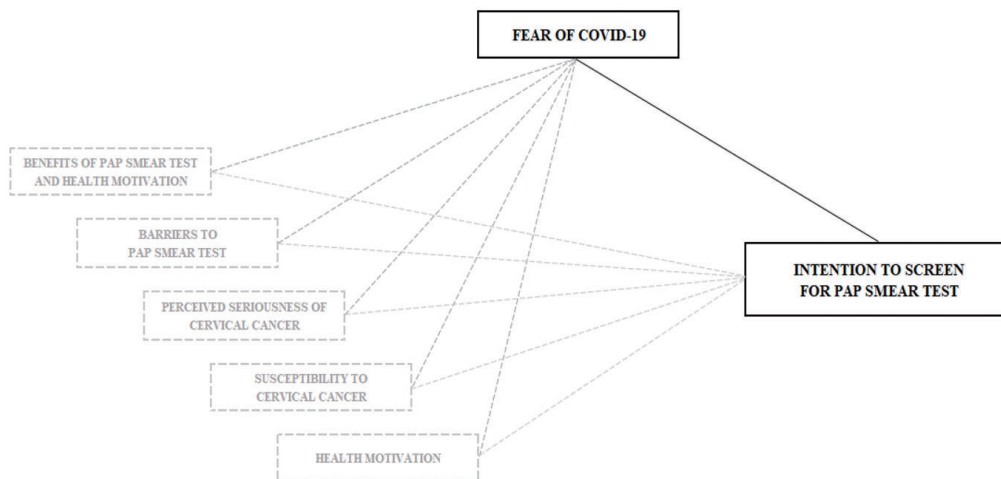

Figure 3. The direct effect of fear of Covid-19 on the intention to have pap smear test

1.5 Fear of Covid-19 as mediator for health beliefs and intention to have pap smear test

The fear of COVID-19 raises public health compliance such as social distancing and hand washing since the perceived threat of COVID-19 is recognized as a major risk to health owing to the rapid rate of spread, serious physical problems, high death rate, and lack of a definite treatment plan.[42, 48, 49] Even if medical institutions have safety measures in place that would render the risk lower to be expose to COVID-19 infection, the fear of COVID-19 exposure puts off preventive care; since weighing the advantages and disadvantages of cancer screening during the COVID-19 pandemic, the immediate threat of contracting COVID-19 may appear to be far more serious than the perceived benefits of cancer screening.[43] According to the data published by the National Health Services Cervical screening program, coverage in England fell during the COVID-19 pandemic, with some locations screening barely half of those who were eligible.[50] This corresponds to the findings of a research which has found a substantial decrease in cervical cancer screening tests in the United States during the rise of COVID-19 cases.[51] In another Jo's Cervical Cancer Trust survey, women from minority ethnic backgrounds (Black and Asian women) have a greater degree of fear and concern because reports claim that those from minority ethnic backgrounds have a probable increased risk of contracting COVID-19. This means that many of them would either not attend or feel less willing to attend cervical screening due to the perceived threat of being infected by the virus.[45]
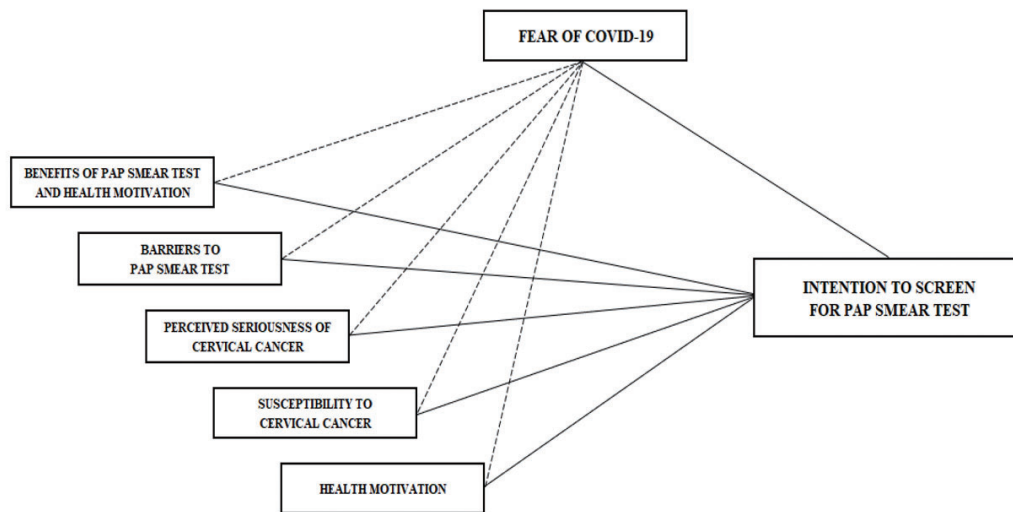

Figure 4. The mediating effect of Covid-19 on the health beliefs on the intention to have pap smear test

2. METHODS

2.1 Data source

The following important principles were observed to effectively manage the ethical considerations component of this research paper. Ethical clearance was granted prior to data collection. The participants were informed about the study and that they will not be harmed in any way during the research process. Participants' full consent was acquired prior to the beginning of the research process. The importance of respondents' voluntary involvement in the study was also emphasized, and participants have the option to withdraw from the study at any time they prefer. The information acquired through survey questionnaires was held strictly confidential and utilized solely for the study's stated objective only. The confidentiality of research participants was protected by ensuring their anonymity throughout the research process which was stored in an encrypted and password-protected computer. As part of the consent, the participants chose to agree or disagree on how their samples shall be stored.

The research study was conducted with regard to the most recent Inter-Agency Task Force (IATF) Guidelines implemented during the duration of the data collection. Data collection procedure was done by visiting communities within the Pampanga area providing a print-out survey form with attached informed consent in a sealed brown envelope. Participants were informed that they do not need to disclose their full names or any other personal information beyond what is requested in the Informed Consent.

The online survey platform has a structured questionnaire generated by Google Forms. A poster with the link to the online questionnaire was disseminated through Facebook's public pages and groups. Participants may use either the link

or the QR code provided on the page and were automatically presented with the survey's first page where they were asked to select the language in which they feel most at ease when completing the questions by clicking on the relevant link. The next presented part was the informed consent for further information.

The next section after the Informed Consent included information about the researcher, as well as the purpose and significance of the study's findings. A brief narration of the background of the study was presented, and the survey was presented into three sections. The first section comprised questions designed to extract information about the women's demographic profile such as present location, age, marital status, educational and work status. In addition, questions relevant to the study were also included such as parity and age of first pregnancy, hormonal contraception usage and duration, tobacco use, awareness of cervical cancer, awareness of Pap smear testing, previous experience of Pap Smear test and familial history of cervical cancer.

The second and third section consisted of the Health Belief Model Scale for Cervical Cancer and the Pap Smear Test followed by the Fear of COVID-19 scale and the structured question for the Intention to have Pap Smear Test. The participant was prompted to click the "submit" button after completing the questionnaires to ensure that the results are recorded.

Acknowledgment of other authors' works utilized in any portion of the thesis paper using a reference system that is appropriate was ensured. Throughout the study process, no conflicts of interest with any other organizations or funding sources have been identified.

2.2 Participant (subject) characteristics

This refers to any female Filipino who (1) currently resides in the Philippines, (2) either single or married, (3) who is at-risk based on the following other characteristics: (a) with a history of three or more pregnancies, (b) currently or previously using hormonal contraceptives for five years or longer, (c) now or previously smoking, or (d) with or without a history of cervical cancer screening shall be the basis for the inclusion criteria. Excluded from the study are women younger than 25 or older than 55, have had a history of cervical cancer, and have undergone hysterectomy (removal of the uterus).

2.3 Sampling procedures

2.3.1 Sample size, power and precision

A power analysis using GPower 3.1 was used to determine the required sample size for the participants. The sample size of 568 participants was needed to detect an odds ratio of 1.3 with an error probability of 0.05 and power values $(1-\beta)$ of

= 0.80.

The participants were selected according to purposive sampling strategy which has involved gathering voluntary participants who met the study's inclusion criteria. After a careful review of both online and print-out forms for completeness of data, an 85% response rate (572 participants) was generated.

2.3.2 Measures and covariates

Descriptive statistics for the demographics and constructs such as frequency and percentage (demographic profile of the participants), standard deviations, and weighted mean (scores for the participants' answers for each construct of the questionnaires) are expressed using the SPSS Ver. 23 Software.

The parameters of the model were estimated using Statistical Package for the Social Sciences (SPSS) Regression Process.[54] SPSS Regression Process was utilized to assess the research's measures and substantive models, as well as investigate the correlations between constructs in the suggested research model.

The measured effect of the mediator on the relationship between the independent and dependent variables, on the other hand, was explored as either a full or partial mediation after statistical significance has been established.

Health Belief Model Scale for Cervical Cancer and the Pap Smear Test. The scale is a valid and reliable tool for evaluating women's health beliefs about cervical cancer and the Pap Smear test.[52] It has 35 items in 5 subscales: Benefits of Pap Smear Test and Health Motivation, Barriers to Pap Smear Test, Perceived Seriousness of Cervical Cancer, Susceptibility to Cervical Cancer, and Health Motivation. All the items of subscales have 5-point Likert-type response choices: strongly disagree, disagree, neutral, agree and strongly agree. Higher scores indicate stronger feelings regarding the specific construct. All scales are positively related to screening behavior except for barriers which have a negative association.

Fear of COVID-19 Scale. The scale was created to assess Fear of COVID–19. This 7-item unidimensional scale possesses strong psychometric qualities, and it is accurate and dependable in measuring COVID-19 fear in the general public.[53] The scale uses a 5-point Likert scale which ranges from strongly disagree, disagree, neutral, agree and strongly agree. The composite score of the scale ranges from 7 to 35, with a higher score indicating greater fear of COVID–19. The tool provides two-factors which includes the emotional fear response which corresponds to the statements; "I am most afraid of the coronavirus," "It makes me uncomfortable to think about the coronavirus," "When I watch news

and stories about COVID-19 on social media, I become nervous or anxious" and "I am afraid of losing my life because of COVID-19". The symptomatic expression of fear corresponds to the statements; "My hands become clammy when I think about getting the coronavirus," "I cannot sleep because I'm worrying about getting COVID-19," and "My heart races or palpitates when I think about getting the coronavirus."

The FCV-19S has no severity scale to measure the level of fear according to the total scores obtained from the participants; hence, a severity scale was adapted from the study of Barua et al. (2020) as follows: mild (score ≤ 25th percentile, score ≤ 17), moderate (score > 25th percentile and < 75th percentile, score 18 to 23) and severe (score ≥ 75th percentile, score ≥ 24).

Intentions to be Screened. Intentions to be screened were assessed using the question: "Are you willing to undergo a Pap Smear test today?" with responses as either yes or no.

Prior to conducting the study, the approval of the respective authors of the tools, requesting their consent to utilize the questionnaires, was obtained. In addition, prior to the collection of data, the study was reviewed by the Holy Angel University Institutional Review Board and was granted ethical clearance. A pilot study with the questionnaire translated in Filipino in ten women to assess its appropriateness, comprehensibility, and any technical issues were carried out and were used to determine whether the instrument was culturally and scientifically appropriate for the Filipino women. Women who took part in the pilot study were not included in the primary investigation.

2.3.3 *Research design*
To answer the research questions, the study employed a quantitative research design. To measure the relationship between the variables, a causal predictive approach was also utilized. The study utilized a purposive sampling strategy which has involved gathering voluntary participants who met the study's inclusion criteria.

3. RESULTS
Table 1 shows key information about the participants who have met the inclusion criteria required for the study. As for location profile, 514 or majority of the participants were from the province of Pampanga with the significant proportion located from the City of San Fernando (290; 50.7%), 84 from the City of Angeles (14.7%) and 57 were from Magalang, Pampanga (10%). Predominantly, participants were aged 30-34 years old (25.9%), with more than 76.2% (436) reportedly married with 71.5% (409) have a Bachelor's Degree in

college. Almost 83.2% (476) was presently employed. In reference with their gynecological history, more than half of the women (321; 56.1%) have their first pregnancy between the ages of 21-30 years of age and almost 55% or 314 participants have been pregnant up to two times. In particular, 179 (31.3%) of the participants listed using pills as a birth control method with 47 (8%) reported six or more until ten years of birth control pills usage. Natural method for birth control is the most preferred (51.7%; 296) while 32 (5.6%) participants report to not use any birth control methods.

Majority of the participants are non-smokers or have never had experienced smoking while five percent (30) of them have been smoking for six years or more than ten years. Most of the participants were aware of the cervical cancer and the Pap Smear test yet only 17.5% (100) of the participants regularly had the Pap Smear test and at least 38.6% or 221 participants have never had a Pap Smear test.

Table 2 shows data for the reliability coefficients for the Fear of COVID-19 scale translated to Filipino language. The research tool is adapted from a published study in Iran[53] and the tool did not have an available Filipino translated version. Hence, the questionnaire was provided with a Filipino version of the original tool which was translated by a professional Filipino translator.

3.1 Statistics and data analysis
Data from the participants' health beliefs as determined by the Health Belief Model Scale for Cervical Cancer and Pap Smear Test shows for Benefits of Pap Smear Test and Health Motivation construct, most participants reported strongly agreeing responses to statements made about the Pap Smear test's stated benefits and health-related motivation. Majority of the women were aware of the advantages of performing cervical cancer screening, as evidenced by the mean score responses of 4.55, which translates to strongly agreeing to the statements: "Having regular Pap smear tests will help to find changes to the cervix, before they turn into cancer", "Maintaining good health is extremely important to me", "I think that having a regular Pap smear test is the best way for cervical cancer to be diagnosed early", "I want to discover health problems early", and "Having regular Pap Smear test will decrease my chances of dying from cervical cancer" respectively.

The Barriers to Pap Smear Test overall result shows most of the participants had low perceived barriers but with preference towards "a female doctor to conduct a Pap Smear test" having the highest score among the statements.

Table 1. Distribution of participants according to demographics and socio-economic profile, pregnancy history, smoking history, awareness and history of pap smear test and cervical cancer (n = 572)

	f	%		f	%
Location			**Age at the time of First Pregnancy**		
Pampanga	514	90.20	Less than 20 years old	98	17.10
City of San Fernando	290		21-30 years old	321	56.10
City of Angeles	84		31-40 years old	40	7.00
Magalang	57		41-46 years old	2	0.40
Mabalacat City	34		No History of Pregnancy	111	19.40
Apalit	11		**Number of Pregnancy**		
Porac	8		1 to 2	314	54.90
Santa Rita	6		3 to 5	142	24.80
Bacolor	5		More than 5	5	0.90
Arayat	4		No History of Pregnancy	111	19.40
Mexico	4		**Birth Control Method**		
San Simon	3		Yes	540	94.40
Dau	2		**A. Pills Only**	179	
Minalin	2		Less than 1 Year	34	
Lubao	1		1-5 Years	98	
Guagua	1		6-10 Years	44	
San Luis	1		More than 10 Years	3	
Santo Tomas	1		**B. Other Birth Control Methods Used**	361	
Davao City	24	4.20	Natural Method (Withdrawal, Calendar, Basal Body Temperature, Mucus Method, Cycle Beads)	296	
Tarlac	19	3.30			
Bulacan	6	1.00	Injectable	35	
Makati City	2	0.30	Condom	18	
Manila City	2	0.30	Implant	7	
Paranaque City	1	0.20	Patch	5	
Lanao del Norte	1	0.20	None At All	32	5.60
Quezon City	1	0.20	**Smoking History**		
Zambales	1	0.20	None	486	85.00
Zamboanga City	1	0.20	Yes	86	15.00
Age			Less than 1 Year	13	2.00
25-29 years old	104	18.20	1-5 Years	43	8.00
30-34 years old	148	25.90	6-10 Years	17	3.00
35-39 years old	115	20.10	More than 10 Years	13	2.00
40-44 years old	97	17.00	**Awareness about Cervical Cancer**		
45-49 years old	62	10.80	Yes	547	95.60
50-55 years old	46	8.00	No	25	4.40
Marital Status			**Awareness about Pap Smear Testing**		
Married	436	76.20	Yes	536	93.70
Single	136	23.80	No	36	6.30
Highest Educational Status			**History with Pap Smear Test**		
Bachelor's Degree in College	409	71.50	Irregular	251	43.90
High School	59	10.30	Never have Pap Smear Test	221	38.60
Technical Vocation	54	9.40	Regular (Every 1-3 years)	100	17.50
Master's Degree	39	6.80	**Family History of Cervical Cancer**		
Elementary	9	1.60	No	539	94.20
Doctorate Studies	2	0.30	Yes	33	5.80
Occupational Status			**Know Anyone who have had Cervical Cancer**		
Employed	476	83.20	No	331	57.90
Unemployed	96	16.80	Yes	241	42.10

Table 2. Reliability composite scoring

Construct	Cronbach's Alpha
	Filipino Version
Fear of COVID-19 n = 7	0.910

Majority of the participants perceive the seriousness of the disease (Perceived Seriousness of Cervical Cancer) as neutrally affecting their relationship with their significant partners, problems to be encountered with cervical cancer would last a long time and living not longer than five years when diagnosed with cervical cancer. However, most was scared just by the thought of having cervical cancer and almost half of the participants would rather not think about cervical cancer and believed that their whole life will change if they will be diagnosed with cervical cancer.

With Susceptibility to Cervical Cancer construct, a larger percentage among the participants report between disagreeing and strongly disagreeing that they will likely get cervical cancer in the future; that their chances of getting cervical cancer in the next few years were high and feel that they will get cancer at some point in their lives perceiving that the risk of them developing cervical cancer is low.

Most of the participants had a neutral and positive perspective in terms of promoting health measures (Health Motivation). In terms of having regular check-ups even when well, most of the participants had a neutral response. However, in comparison with eating a healthy, balanced diet and engaging in physical exercises, majority "agrees" with the statement although there were no specifications or listing of the type of food consumed or by the type and frequency of exercises performed by the participants.

Table 4 shows the measured result of the assessment of fear of COVID-19 among the participants. Majority of the participants agreed and strongly agreed to being fearful and losing their lives because of COVID-19. However, the other statements were provided a neutral and disagreeing response as to the other emotional fear response and symptomatic fear response. Severity scale result shows moderate fear towards COVID-19.

Table 5 displays the surveyed participants' readiness to take part if Pap Smear test would be offered on the day they participated. Majority of the participants had a positive response to their intention to undergo screening for Pap Smear test when asked "Are you willing to undergo a Pap Smear test today?".

As seen in Table 6, logistic regression was performed to ascertain the effects of Perceived Benefits of Pap Smear Test

and Health Motivation, Perceived Barriers to Pap Smear Test, Perceived Seriousness of Cervical Cancer and Health Motivation on the willingness to undergo a Pap smear test. The logistic regression model is statistically significant, $\chi^2(3) = 97.6$, p-value of $< .005$. The model explains 23.1% (Nagelkerke R2) of the variance in willingness to undergo a Pap smear test and correctly classify 76.7% of cases. The direct effect on perceived benefits ($\beta = .69$, ρ – value = 0.004) and perceived barriers are statistically significant ($\beta = -1.34$), ρ – value = 0.001), positively and negatively.

As a result, the first requirement of mediation analysis according to which the independent variable/s should be statistically significant predictor/s of the dependent variable is well met by the following health belief constructs: (1) Benefits of Pap Smear test and Health Motivation, and (2) Barriers to Pap Smear test.[55] With regard to perceived seriousness of cervical cancer, perceived susceptibility to cervical cancer, and health motivation, these are not statistically significant to have a direct effect on willingness to undergo a Pap smear test.

As seen on Table 7, linear regression is performed to establish the direct effect of the Health Belief constructs (Perceived Benefits of Pap Smear Test and Health Motivation and Perceived Barriers to Pap Smear Test) on the Fear of COVID-19. The findings show a significant negative effect between perceived benefits to Pap Smear Test and health motivation ($\beta = -0.18$), ρ – value = 0.005) on the Fear of COVID-19 which shows that women who have higher perceived benefits to pap smear test and health motivation had lower fear to COVID-19. On the other hand, barriers to Pap smear test ($\beta = 0.17$), ρ – value = 0.001), perceived seriousness of cervical cancer ($\beta = 0.24$), ρ – value = 0.001), susceptibility to cervical cancer ($\beta = 0.08$), ρ – value = 0.021) and health motivation ($\beta = 0.13$), ρ – value = 0.001) also had a significant but positive effect on the fear of COVID-19. This shows that low barriers to Pap Smear test, low perceived seriousness to cervical cancer, low perceived susceptibility to cervical cancer and low health motivation resulted in low fear of COVID-19. The result then satisfies the second requirement for mediation as shown that the independent variables (health beliefs) were statistically significant predictors of the mediating variable (fear of COVID-19).[55] In this case, the mediator functions as the dependent variable for the independent variable.

To establish the direct effect between fear of COVID-19 on the intention to screen for Pap Smear test, a logistic regression analysis was performed. In Table 8, the result shows significant negative direct effect ($\beta = -0.76$), ρ–value = 0.001) between the two variables. Accordingly, the intention to screen for a Pap Smear test would increase with a lower

COVID-19 fear score. In this case, the third criterion for the mediation was also met.[55] Fear of COVID-19 was a significant predictor of the intention to screen for Pap Smear test while controlling for the effect of the health belief constructs. Here, it shows the mediator functions as the independent variable towards the dependent variable.

Table 3. Health belief model for cervical cancer and the pap smear test

| A. Benefits of Pap Smear Test and Health Motivation	Mean	SD	Interpretation
Overall	4.55	0.61	Strongly Agree
1. Having regular Pap smear tests will help to find changes to the cervix, before they turn into cancer	4.79	0.72	Strongly Agree
2. Maintaining good health is extremely important to me	4.79	0.43	Strongly Agree
3. I feel it is important to carry out activities which will improve my health.	4.70	0.48	Strongly Agree
4. I want to discover health problems early.	4.68	0.57	Strongly Agree
5. I look for new information to improve my health.	4.60	0.56	Strongly Agree
6. I think that having a regular Pap smear test is the best way for cervical cancer to be diagnosed early.	4.53	0.62	Strongly Agree
7. Having regular Pap smear tests will decrease my chances of dying from cervical cancer	4.52	0.62	Strongly Agree
8. If cervical cancer was found at a regular Pap smear test its treatment would not be so bad	4.35	0.77	Strongly Agree
B. Barriers to Pap Smear Test	**Mean**	**SD**	**Interpretation**
Overall	2.34	1.05	Disagree
1. I prefer a female doctor to conduct a Pap smear test.	3.80	1.22	Agree
2. Having a Pap smear test is too painful.	2.44	1.06	Disagree
3. I am afraid to have a Pap smear test because I don't know what will happen.	2.41	1.12	Disagree
4. I have other problems more important than having a Pap smear test in my life.	2.34	1.06	Disagree
5. There is no health center close to my house to have a Pap smear test.	2.33	1.05	Disagree
6. If there is cervical cancer development in my destiny, having a Pap smear test cannot prevent it.	2.26	0.99	Disagree
7. I neglect or cannot remember to have a Pap smear test regularly.	2.25	1.12	Disagree
8. I would be ashamed to lie on a gynecologic examination table and show my private parts to have a Pap smear test	2.20	1.09	Disagree
9. Having a Pap smear test takes too much time.	2.14	0.92	Disagree
10. I am afraid to have a Pap smear test for fear of a bad result.	2.12	1.17	Disagree
11. I don't know where to go for a Pap smear test.	2.06	1.05	Disagree
12. I will never have a Pap smear test if I have to pay for it.	1.99	1.03	Disagree
13. I am too old to have a Pap smear test regularly.	1.93	0.94	Disagree
14. Health professionals doing Pap smear test are rude to women.	1.75	0.80	Strongly Disagree
C. Perceived Seriousness of Cervical Cancer	**Mean**	**SD**	**Interpretation**
Overall	3.35	1.07	Neutral
1. The thought of cervical cancer scares me.	3.76	1.04	Agree
2. If I had cervical cancer my whole life would change.	3.65	1.03	Agree
3. I am afraid to think about cervical cancer.	3.58	1.07	Agree
4. Problems I would experience with cervical cancer would last a long time.	3.39	1.06	Neutral
5. When I think about cervical cancer, my heart beats faster.	3.26	1.10	Neutral
6. Cervical cancer would threaten a relationship with my boyfriend, husband, or partner.	2.95	1.15	Neutral
7. If I developed cervical cancer, I would not live longer than 5 years.	2.83	1.03	Neutral
D. Susceptibility to Cervical Cancer	**Mean**	**SD**	**Interpretation**
Overall	1.95	0.93	Disagree
1. It is likely that I will get cervical cancer in the future.	2.07	1.03	Disagree
2. My chances of getting cervical cancer in the next few years are high	1.93	0.89	Disagree
3. I feel I will get cervical cancer some time during my life.	1.86	8.77	Disagree
E. Health Motivation	**Mean**	**SD**	**Interpretation**
Overall	3.62	1.02	Agree
1. I eat well balanced meals for my health.	4.01	0.92	Agree
2. I exercise at least 3 times a week for my health.	3.46	1.10	Agree
3. I have regular health check-ups even when I am not sick.	3.40	1.02	Neutral
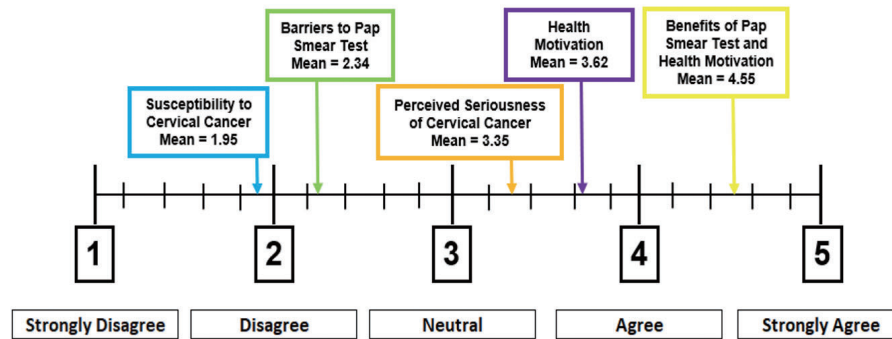
Figure 5. Diagram of overall mean for health beliefs

Table 4. Fear of COVID-19

Fear of COVID-19	Mean	SD	Interpretation
Overall	2.98	1.03	Neutral
A. Emotional Fear of Response			
1. I am afraid of losing my life because of COVID-19.	3.97	1.00	Agree
2. I am most afraid of COVID-19.	3.53	1.07	Agree
3. It makes me uncomfortable to think about COVID-19.	3.15	1.10	Neutral
4. When I watch news and stories about COVID-19 on social media, I become nervous or anxious.	3.03	1.10	Neutral
B. Symptomatic Fear Response			
5. My hands become clammy when I think about COVID-19.	2.51	0.96	Disagree
6. My heart races or palpitates when I think about getting COVID-19.	2.41	1.02	Disagree
7. I cannot sleep because I'm worrying about getting COVID-19.	2.32	0.97	Disagree
Severity Score for Fear of COVID-19	**Mean**	**SD**	**Interpretation**
Overall	20.92	5.34	Moderate Fear

Table 5. Intention to screen for pap smear test

Intention to Screen for Pap Smear Test	Mean	SD	Interpretation
Are you willing to undergo a Pap Smear Test today?	0.74	0.436	Yes

The mediating effect of fear of COVID-19 in the model as presented in Table 9 showed that benefits and barriers to Pap Smear test had a positive and negative significant effect on the intention to screen for Pap Smear test.

Table 6. Direct effect of health beliefs on the intention to have pap smear test

Omnibus Tests of Model Coefficients						
Step 1	**Chi-square**	**df**		**_p_-values**		
Step	97.626	5		< .001		
Block	97.626	5		< .001		
Model	97.626	5		< .001		
Model Summary						
-2 Log likelihood		**Cox & Snell R Square**		**Nagelkerke R Square**		
552.193*		0.157		0.231		
Classification Table						
		Predicted				
Observed		**Intention to Screen for Pap Smear Test**		**Percentage Correct**		
		No	**Yes**			
Pap Smear	No	39	107	26.70		
	Yes	26	400	93.90		
Overall Percentage				76.70		
Variables in the Equation						
Variables	**β**	**Standard Error**	**Wald**	**df**	**_p_-value**	**Exp (B)**
Benefits of Pap Smear Test and Health Motivation	0.69	0.238	8.339	1	0.004	1.987
Barriers to Pap Smear Test	-1.34	0.197	46.73	1	0.001	0.261
Perceived Seriousness of Cervical Cancer	-0.05	0.174	0.083	1	0.773	0.951
Susceptibility to Cervical Cancer	0.02	0.121	0.017	1	0.898	1.016
Health Motivation	-0.23	0.138	2.950	1	0.086	0.789

*Dependent variable: Intention to have Pap Smear Test

Table 7. Direct effect of health beliefs on fear of COVID-19 (Path A)

ANOVA*					
Model	**Sum of Squares**	**df**	**Mean Square**	***F***	***p*-values**
Regression	53.465	5	10.69		
Residual	248.065	566	0.44	24.40	.000#
Total	301.53	571			

Model Summary#				
Model	***R***	***R* Square**	**Adjusted *R* Square**	**Standard Error of the Estimate**
1	.421#	0.177	0.17	0.662

Coefficients*					
	Unstandardized Coefficients		**Standard Coefficients**	*t*	*p*-values
Variables	β	**Standard Error**	**Beta**		
Benefits of Pap Smear Test and Health Motivation	-0.18	0.065	-0.112	-2.772	.005
Barriers to Pap Smear Test	0.17	0.047	0.158	3.558	.001
Perceived Seriousness of Cervical Cancer	0.24	0.038	0.26	6.174	.001
Susceptibility to Cervical Cancer	0.08	0.033	0.092	2.322	.021
Health Motivation	0.13	0.035	0.149	3.819	.001

*Dependent Variable: Fear of COVID-19; #Predictors: (Constant), Benefits of Pap Smear Test and Health Motivation, Barriers to Pap Smear Test, Perceived Seriousness of Cervical Cancer, Susceptibility to Cervical Cancer, Health Motivation.

Table 8. Direct effect of fear of COVID-19 on the intention to screen for pap smear test

Coefficients*				
Variables	**Coefficient**	**Standard Error**	**Z**	***p*-value**
Fear of COVID-19	-0.76	0.174	- 4.360	.001

*Dependent Variable: Intention to have Pap Smear Test

The other health belief constructs (perceived seriousness of cervical cancer, perceived susceptibility to cervical cancer, and health motivation) show no significant effect on the intention to screen. While these constructs had somewhat satisfied the second mediation criterion, the first condition was not met, thereby rendering these variables not significant predictors of the intention to screen and a causal effect from a mediator will be highly unlikely.

Table 9. Mediating effect of fear of COVID-19 on health beliefs on the intention to screen for pap smear test

Coefficients*				
Variables	**Coefficient**	**Standard Error**	**Z**	***p*-value**
Benefits of Pap Smear Test and Health Motivation	0.54	0.2421	2.220	0.026
Barriers to Pap Smear Test	-1.27	0.2012	- 6.328	0.001
Perceived Seriousness of Cervical Cancer	0.20	0.1795	1.010	0.280
Susceptibility to Cervical Cancer	0.09	0.1249	0.717	0.474
Health Motivation	-0.11	0.1412	- 0.763	0.445
Fear of COVID-19	-0.76	0.174	- 4.370	0.001

*Dependent Variable: Intention to have Pap Smear Test

This shows that the observed effect of the health beliefs (perceived benefits and perceived barriers to Pap Smear test) on intention to screen though somewhat decreased, (from first criteria Direct Effect β = .69 to mediation Direct Effect β = .54 for perceived benefits; first criteria Direct Effect β = -1.34 to mediation Direct Effect β = -1.27 for perceived barriers) was still substantial. This, in turn, indicated that a partial mediation was in effect which supported the findings that their fear of COVID-19 had low effect on the benefits and barriers to Pap Smear test, thereby does not have a strong significant influence when it comes to the participants' intention to screen.

4. DISCUSSION

This study explores the mediating effect of fear of COVID-19 on the associations between Filipino women's health beliefs and the intention to screen for Pap Smear test. The outcome of the mediation analysis shows that the mediated effect of fear of COVID-19 is not particularly significant. This suggests that there is still a significant direct association between health beliefs, particularly on the benefits of Pap Smear test and health motivation and barriers to Pap Smear test with the intention to screen even without the presence of fear. The higher perception of women in this study on the benefits of pap smear test screening demonstrated higher intention to screen would greatly explain how self-care is being carried out by an individual. It is assumed that the individual's decision to engage in a behavior is influenced by the anticipated outcomes and advantages.[56] It is important to emphasize that the participants are more likely to believe that the risk of getting COVID-19 will be outweighed by the screening test which is more beneficial to their health outcome. The findings also supported previous studies that show women who have lower perception on the barriers to Pap smear test show a higher intention to undergo a Pap smear test.[57–59] In this study, the participants "agreed" that a female doctor is preferable to conduct the examination which would potentiate a barrier if a male doctor will be doing the examination. While it was a relatively minor factor, given that the majority of participants disagreed with the other barriers mentioned, this barrier was one of the main causes of women refusing or second-guessing getting a Pap Smear test.[13, 60, 61]

On the other hand, health beliefs have a direct significant relationship towards fear of the COVID-19 positively and negatively. This suggests that fear towards COVID-19 tends to be lower when perceived benefits toward Pap Smear test and health motivation are higher while the other constructs point out that the lower the barriers to Pap Smear test and the lower perceived susceptibility and seriousness of cervical cancer and health motivation, the fear towards COVID-19 is also lower. This would suggest that the participants are more likely to believe that the risk of getting COVID-19 is outweighed by the actions they would take which is more beneficial to their health outcome. Subsequently, the possibility that the study was conducted between February to June of 2022, when the Alert Level of risk was declining due to a reduction in the number of COVID-19 cases nationwide,[62] would be another factor that could properly be considered for the benefits to outweigh the risk of contracting the virus.

Despite the less fear toward COVID-19 is manifested by the majority of the participants, it is still important to emphasize that there are also women in the study who show severe fear towards COVID-19, and this could highly impact their willingness and intention to screen. This means that, in addition to their health beliefs having a direct effect on their intention to screen, it may also do so due to their fear of COVID-19. Several studies have shown that a higher COVID-19 fear score seriously affects women's self-care management, limiting their access to the necessary procedures needed for the screening of cervical cancer. Concerns have been expressed about the number of cervical cancer cases that were overlooked as a result and interruptions to routine cervical cancer screening could lead to an increase in cervical cancer diagnoses in the future.[63–67]

In conclusion, this study demonstrated the mediating effect of fear of COVID-19 on the associations between Filipino women's health belief toward their intention to screen. It was established that the participants' health beliefs, particularly on the benefits and barriers of Pap Smear tests towards their desire to screen although have substantial impact, were not significantly affected by the fear of COVID-19. This implies that the fear of COVID-19 plays a minor effect in the association between Filipino women's health beliefs and their intention to attend Pap smear testing. This further suggests for healthcare professionals on the implications of their role in encouraging and educating women to get screened despite the recent pandemic status globally. Yet, with much recent easing restrictions towards health care delivery owing to low risk status nationwide, this can further motivate willingness to screen.

Despite being preventable and treatable, cervical cancer continues to be a serious public health issue that affects women who are of reproductive age. Therefore, improving a comprehensive cervical cancer screening strategy could encourage early cancer identification in women and help to minimize the mortality rates related to cervical cancer. Despite several threats to the utilization of screening, it is hoped that when benefits are acknowledged and barriers are removed or minimized, the uptake of screening will further increase.

AUTHORS CONTRIBUTIONS

HG Romarate-Abella was the principal investigator. She was responsible for the study design, recruitment, data gathering, data analysis and drafted the writing of the manuscript. J Cura supervised with the whole process of the research providing significant inputs regarding revisions and the research

design and data analysis. All authors read and approved the final manuscript. Authorship was agreed upon based on contributions in the study.

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The authors declare that there are no competing interests related to this research study.

INFORMED CONSENT

Obtained.

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PROVENANCE AND PEER REVIEW

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

DATA SHARING STATEMENT

No additional data are available.

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