CANCER RISK ASSESSMENT INSTRUMENTS IN WOMEN: LITERATURE REVIEW

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Abstract

Early detection of cancer or cancer screening is important. The right measurement tool is needed to conduct early detection of cancer. The instrument of assessment would help health workers in the early detection of cancer in women. This literature review aimed to identify instruments for detecting the risk of cancer in women. The research method was a literature review, the articles were searched from four databases including CINAHL, Science Direct, Pubmed and Proquest. After the critical appraisal, there were 5 articles that fit the inclusion criteria, including the publication year from 2014 to 2019. The results found four instruments such as Breast cancer risk assessment (BCRA); Six Point Scale and Referral Screening Tool (RST); Perceived risk scale; Online self-test questionnaires. Not much research has been done using instruments to assess the risk of cancer in women. Limited instruments were found in this study even though the incidence of cervical cancer is also high. More research is needed to develop instruments for assessing cancer risk in women, especially cervical cancer.

Key words: Early detection, risk assessment instrument, women's cancer.

INTRODUCTION

Breast cancer and cervical cancer are identified as the most deaths causes of women in the world, respectively 15.0% and 7.5% (IARC, 2018). Based on 2018 GLOBOCAN data, the highest incidence of cancer for women in Indonesia is breast cancer, which is 42.1 per 100,000 population with an average dead of 17 per 100,000 population, followed by cervical cancer of 23.4 per 100,000 population with an average death 13.9 per 100,000 population (IARC, 2019). These data indicate that the incidence and death rates from breast cancer and cervical cancer are still high.

Various programs have been made by the government to reduce the incidence of breast cancer and cervical cancer, including early detection or screening programs. Until 2014, early detection programs for breast cancer and cervical cancer have been running in 1,986 Health Public Centers in 304 districts/cities in 34 provinces in Indonesia (Pusat Data dan Informasi Kementerian Kesehatan RI, 2015). However,

coverage of early cervical cancer (IVA) detection in Indonesia in 2018 is still low, at 2,747,662 women (7.34%) of the target 37,415,483 women aged 30-50 years. Based on the results of early detection by the IVA method, there were 77,969 positive IVA cases and 3,563 suspected cervical cancer cases. Also found 16,956 cases of breast tumors and 2,253 cases were suspected of being breast cancer (Kementerian Kesehatan RI, 2019). It was concluded that women's participation in early detection of breast cancer and cervical cancer in Indonesia is still low.

Early detection or screening is an effort to detect cancer early, so it is important to do, as a lot of women were came to hospital in advance stage and threaten their quality of life (Berly, Widianti, & Ermiati, 2018; Haris, Rahayuwati, & Yamin, 2018; Nuraeni & Handayani, 2018) . In addition, an appropriate measurement instruments are needed to help detect early cancer risks. Assessment instruments would help health workers to detect the early signs of cancer in women. Nurses have a role to develop or innovate of health care interventions including at the assessment stage. Part of assessment, nurses need an assessment instrument to determine the risk of cancer in women. By knowing the risk of cancer early, it is expected that the coverage of women's cancer screening participation in women would increase. The development of the instrument can begin by conducting a literature review and research. This study aims to identify instruments or tools for assessing cancer risk in women.

METHODS

The research method was a literature review. Searching for articles was conducted in September 2019, through four databases namely Pubmed, Science Direct, CINAHL, and Proquest. The keywords used in the search are (assessment form OR assessment scale) AND (screening OR early detection) AND (gynecology cancer risk OR woman cancer risk). A total of 5,349 articles were taken based on the 2014-2019 criteria, English language and research articles. A total of 8 articles are duplicates. A total of 37 articles met the inclusion criteria, namely articles in the form of instruments for assessing early detection or cancer risk in women, primary

research, not protocol studies. Furthermore, screening is done by reading the title of the article and abstract by the theme of the article, which is an instrument for cancer assessment in women. Finally, 5 articles were included in the analysis. Diagram 1 explains the process of selecting articles.

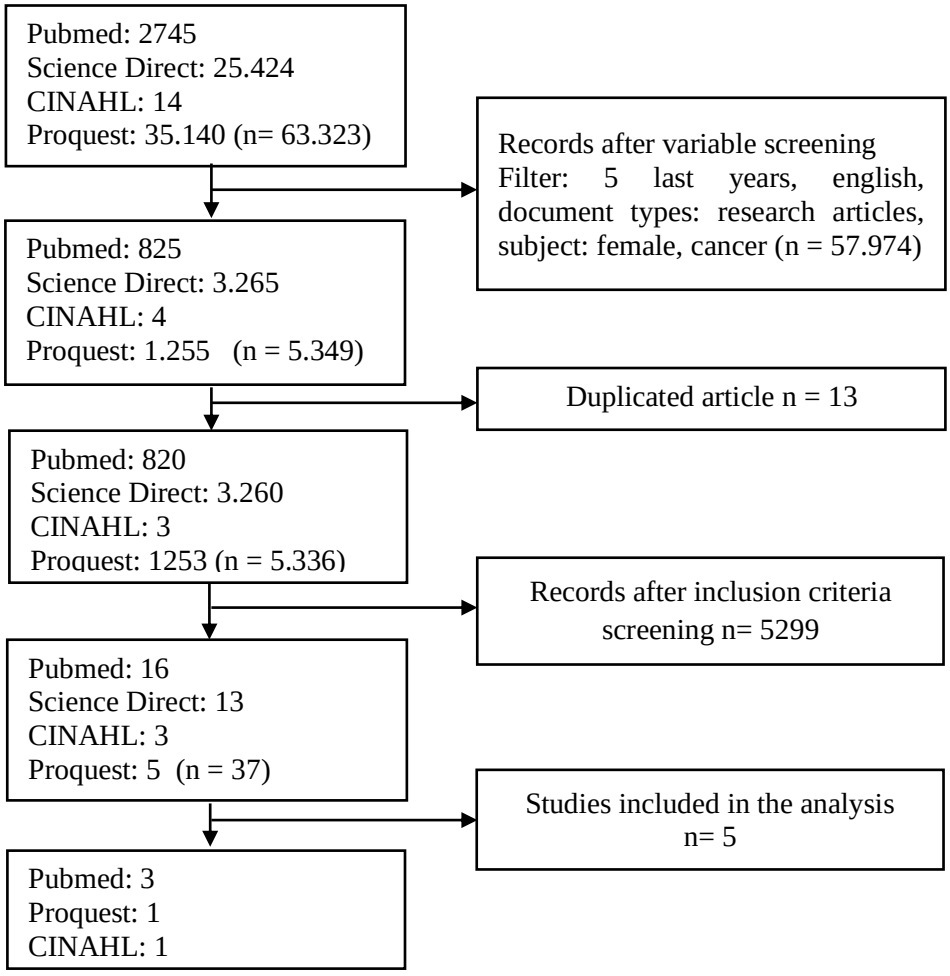

Diagram.1 The flowchart of articles' selection processes

RESULTS

The articles in this study, consisting of 2 descriptive studies (Iz & Tümer, 2016; Morman, Byrne, Collins, Reynolds, & Bell, 2017), 1 cohort study (Van Erkelens et al., 2017), 1 randomized controlled trial study (Stewart et al., 2016) and 1 cross-sectional study (Seven, Bagcivan, Akyuz, & Bolukbas, 2017). The number of study participants was 4,213 people. The results of the review found five instruments for assessing breast cancer risk in women. The results of the literature review study are explained in table 1.

DISCUSSION

Based on the results of the literature, various studies have been found that test the effectiveness of instruments or formats to detect breast cancer risk in women, namely breast cancer risk assessment, perceived risk scale, online self-test questionnaires, six-point scale, and referral screening tool.

Breast cancer risk assessment (BCRA)

Morman, Byrne, Collins, Reynolds, & Bell, (2017) research examines the effectiveness of breast cancer risk assessment (BCRA) to increase women's awareness of breast cancer. The risk of breast cancer is categorized as an average risk of less than 15%, a moderate risk of 15-19%, and a high risk of 20% or more. High-risk classification uses the Gail model, the Claus model, and the Tyrer-Cuzick model. The results showed that breast cancer risk assessment (BCRA) did not significantly affect a woman's understanding of cancer risk to herself or adherence to care so that resources and processes were needed for the success of BCRA offerings for each woman. Limitations of the study are the small number of samples, the average respondent has a low socioeconomic class so that it can affect adherence to recommendations and not known interactions between doctors or patients are important factors in influencing respondent compliance (Morman et al., 2017). Thus further studies are needed by considering these various factors.

Tabel 1. Cancer risk assessment instruments in women

No	Title	Author/ Country	Design	Sample	Inclusion criteria	Intervention	Instrument	Result	Conclusion
1	Assessment of Breast Cancer Risk and Belief in Breast Cancer Screening Among the Primary Healthcare Nurses	(Iz & Tümer, 2016) Turkey	Descriptive research	65	Nurses aged 15-49 years, working in family health centres (FHCs).	Breast Cancer Risk Assessment (BCRA) form contains of 21 items structured under six different sections, namely participant's age, family and personal history of breast cancer, childbearing age, menstrual history, and body type. The level of risk is classified into: low risk (200 points and below), moderate risk (201– 300 points), high risk (301–400 points), and highest risk (more than 400 points). Champion's Health Belief Model Scale (CHBMS) was developed by Dr. Victoria Lee Champion in 1993. This study uses the Turkish version of the CHBMS instrument, adapted by Gozum and Aydin (2004). This version of the scale contains 52 Likert-type items under six subscales addressing the domains of perceived susceptibility, perceived	Breast Cancer Risk Assessment Form and Champion's Health Belief Model Scale (CHBMS)	The results showed that participants with advanced age, alcohol consumption, BMI overweight, had significantly higher mean score for breast cancer risk ($p < 0.05$). Participants who used birth control pills ≥ 5 years had significantly higher score for the domain of perceived susceptibility and self-efficacy ($p < 0.05$). Participants who smoked ≥11 cigarettes a day had greater scores for the subscales of barrier to BSE and perceived self-efficacy ($p < 0.05$). No diet rich in dietary fiber, fruit, and vegetables had higher score in the subscales of barrier to BSE ($p < 0.05$). Participants who ate fiber-rich foods regularly scored higher in the area of health motivation ($p < 0.05$).	Nurses had below-average perceived susceptibility, lower perceived severity, an above-average mean score for perceived benefits, a moderate barrier perception, a relatively high perceived self-efficacy, and motivation above average. One recommendation is to repeat this study with a larger sample of nurses different areas.

						severity, benefits of BSE, barriers to BSE, self-efficacy, and health motivation.			
2	Breast Cancer Risk Assessment at the Time of Screening Mammography: Perceptions and Clinical Management Outcomes for Women at High Risk	(Morman et al., 2017) USA	Prospective descriptive study	2881	Women ≥18 years of age who underwent a screening mammogram performed between 23 September 2013 and 31 May 2014, who chose to receive a complimentary BCRA, and who received the BCRA results and recommendations letter at least 6 months prior to mailing the study survey	At the time of screening mammography, all women completed history form and indicated their choice to have a BCRA. For women who choose BCRA will be adjusted to the inclusion criteria, if they meet, included as respondents. Lifetime risk of breast cancer is categorized as: an average risk of less than 15%, a moderate risk of 15-19%, and a high risk of 20% or more. High risk classification uses the Gail model, the Claus model and the Tyrer-Cuzick model.	Breast cancer risk assessment (BCRA)	Of 2881 eligible women, 309 women as high risk for developing breast cancer, 306 women as moderate risk, and 2266 women as average risk. High risk women ranged in age from 25 to 81 years. Only 1 respondent was categorized as high risk by the Gail model, all other women classified by Claus and / or the Tyrer-Cuzick model. Most respondents (65%) did not show a change in risk perception.	Breast cancer risk assessment (BCRA) may not impact a woman's understanding of her cancer risk nor her compliance with health care recommendations should signal institutions and physicians to carefully assess the resources and processes necessary to offer a BCRA successfully to all women.
3	Validation of an efficient screening tool to identify	(Stewart et al., 2016) California	Randomized controlled trial	744	Women 40-75 years of age.	This study used two samples of patients to make a comparisons. The first sample consisted of public hospital	"Six Point Scale" and Referral Screening Tool (RST)	Of 744 respondent, 351 women (Group A) confirmed as high risk, 334 women (Group B) confirmed as not high risk and	The 6 Point Scale is potentially useful as a simple tool, requiring minimal time investment by health workers and

	low income women at high risk for hereditary breast cancer				mammography clinic patients (S1) and primary care patients participating in a randomized controlled trial (S2). Women completed the risk assessment questionnaire by telephone or tablet computer in their preferred language.. Comparisons of the "Six Point Scale" with the genetic counsellors (GC) classification and Referral Screening Tool (RST). "Six Point Scale" consists of 10 questions and RST 3 questions.		59 women from group B reclassified as high risk by GC. The 6 Point Scale had low sensitivity (0.27, 95% confidence interval (CI) 0.21–0.34), but high specificity (0.97, 95% CI 0.95–0.99) and AUROC (0.85, 95% CI 0.81–0.90) versus GC classification, and high sensitivity (S1: 0.90, 95% CI 0.79–1.00; S2: 0.94, 95% CI 0.87–0.97), specificity (S1: 0.95, 95% CI 0.93`–0.97; S2: 0.94, 95% CI 0.93–0.96), and AUROC (S1:0.98, 95% CI 0.96–0.99; S2: 0.98, 95% CI 0.98–0.99) versus the RST.	no financial investment.
4	Women with Family History of Breast Cancer: How Much Are They	(Seven et al., 2017) Turkey	Cross sectional	117	The sample comprised the first- (mother, daughter, sister) and the second-degree (maternal or paternal aunt,	Data collection during 12 month. Knowledge assessment form developed by researchers based on the literature for women to self-assess basic knowledge of	Perceived risk scale, cancer worry chart, and knowledge assessment form	Of the women, 34.1% were first-degree relatives of a breast cancer patient, and knowledge score was 6.9 ± 2.19 out of 11. There are statistically significant differences	The knowledge level of women regarding inheritance characteristics of breast cancer and risk reduction strategies was

	Aware of Their Risk?				grandmother) relatives of women with breast cancer who were admitted to medical oncology inpatient/outpatient clinics. The eligibility criteria were being female, age over 18 years, being able to communicate verbally in Turkish, and having a family member who was diagnosed with breast cancer.	inheritance characteristics of breast cancer and risk reduction strategies. Developing *Perceived risk scale* based on *visual analogue scale* (VAS). The women were asked to estimate what their lifetime risk (from 0 to 100%) of developing breast cancer was categorized into five groups as not at all (0%), slight (1–25%), moderate (26–50%), quite a bit (51–75%), and extreme (76–100%)		for the perceived risk level of women between the educational level (p<0,037), having genetic testing (p<0,005). Also, there is a statistically significant and positive relationship between the perceived risk and worry level (p<0,000). However, the difference between women's early detection behaviours and the level of perceived risk and worry were not statistically significant (p (p>0,05).	moderate, the majority of women overestimated their breast cancer risk, and almost half of women indicated moderate worry level about developing breast cancer. Therefore, interventions should be planned to reduce worry and to increase risk reduction strategies such as screening and other health behaviours in women who were at potentially higher risk for cancer due to a family history.
5	Online self-test identifies women at high familial breast cancer risk in population-	(Van Erkelens et al., 2017) Netherlands	Prospective cohort study	406	Not diagnosed as having an increased risk of cancer in the family, not having a history of breast cancer.	Respondents who met the criteria at the time of screening, filled out an online self-test questionnaire after being given instructions. After 2 weeks, after all women attending screening	Non-compulsory questionnaires, online self-test questionnaires	A high or moderate FBC risk was identified in 12 (4%) and three (1%) women, respectively. After completion of the online self-test, anxiety and BC risk perception were decreased while	The online self-test identified previously unknown women at high FBC risk (4%), who may carry a BRCA1/2-mutation, without inducing anxiety or distress. This study recommend offering

based breast cancer screening without inducing anxiety or distress		mammography had received their mammography test result, respondents were invited to complete a follow-up questionnaire. Similar The online self-test automatically provides one of three personalised conclusions: high FBC risk, moderate FBC risk and BC risk.	distress scores remained unchanged.	this self-test to women who attend population-based screening mammography for the first time.

Similar research was conducted by Iz & Tümer, (2016) in Turkey, to assess the risk of breast cancer in nurses, using the breast cancer risk assessment form and Champion's Health Belief Model Scale (CHBMS). The Breast Cancer Risk Assessment Form consists of 21 items and 6 domains, namely age, history of post-participant and family breast cancer, childbearing age, menstrual history, and body type. The results of the study using the breast cancer risk assessment form showed that participants with advanced age, alcohol consumption, BMI overweight, had a significantly higher average score for breast cancer risk ($p < 0.05$). Based on the Champion's Health Belief Model Scale (CHBMS), participants who used birth control pills ≥ 5 years had a significantly higher score for the domain of perceived vulnerability and self-efficacy ($p < 0.05$). Participants who smoked ≥11 cigarettes a day had a greater score for the barrier subscales for BSE and perception of self-efficacy ($p < 0.05$). Not on a diet rich in fiber, fruit, and vegetables had a higher score in the barrier subscale for BSE ($p < 0.05$). Participants who ate fiber-rich foods regularly scored higher in the area of health motivation ($p < 0.05$) (Iz & Tümer, 2016).

Nurses have a key role in providing education about breast health and the promotion of healthy behavior. However, in this study, nurses had lower perceived susceptibility, perceived severity, benefits of BSE, and health motivation compared to other studies. Thus, interventions such as instructional courses are needed to improve nurses' skills, knowledge, and attitudes towards breast cancer. In addition, further research is needed with larger sample sizes in different areas.

Perceived risk scale

Research Seven et al., (2017) in Turkey, examines the risk of breast cancer in respondents who have family members with breast cancer. The instrument used is the perceived risk scale based on the visual analog scale (VAS), containing the estimated risk of developing breast cancer in the range of 0-100%, consisting of 5 categories: none at all (0%), few (1-25%), moderate (26-50%), quite a lot (51-75%), and extreme (76-100%). The results showed that 34.1% of respondents were the first relatives of breast cancer patients with a knowledge score of 6.9 ± 2.19 out of 11. There was a

significant relationship between risk perception and education level (p <0.037), undergoing genetic testing (p <0.005). Besides, there was a significant relationship between perceived risk and women's level of concern (p <0,000). However, breast cancer screening behavior is not influenced by risk perception (p> 0.05) (Seven et al., 2017).

Respondents' knowledge of inherited breast cancer characteristics and risk reduction strategies is moderate, but most women still have moderate or higher risk perceptions and are worried about developing breast cancer. Therefore, interventions must be planned to reduce concerns and to improve risk reduction strategies such as screening and other healthy behaviors in women at risk of breast cancer.

Online self-test questionnaires

Van Erkelens et al., (2017) in the Netherlands, used an online self-test method to identify the risk of breast cancer in families. Questionnaires through online tests automatically provide one of three conclusions, namely the risk of breast cancer in high, moderate families and the risk of developing breast cancer. The results showed that the online self-test identified women who were not previously known to have a high risk of breast cancer in the family, so it was recommended to be offered to women who would undergo screening (Van Erkelens et al., 2017).

Six Point scale and Referral Screening Tool (RST)

Stewart et al., (2016) conducted a study in California, to test the validity of screening tools in assessing breast cancer risk. The instrument used is the Six Point Scale consists of 10 items and the Referral Screening Tool (RST) consists of 3 items. The results showed, of the 744 respondents, 351 respondents (Group A) were classified as high risk, 334 respondents (Group B) were classified as not high risk, and 59 respondents from group B were classified as high risk by genetic counselors (GC). The sensitivity of the "Six Point Scale" is associated with high RST, ie (S1: 0.90 95% CI 0.79-1.00; 0.94, 95% CI 0.87-0.97), specificity (S1: 0 , 95, 95% CI 0.93-0.97); S2: 0.94, 95% CI 0.93-0.96) and AUROC (S1: 0.98, 95% CI 0.96-0.99; S2: 0.98, 95% CI

0.98- 0,99); Kappa values indicate substantial agreement (S1: 0.64, 95% CI 0.58-0.71; S2: 0.72, 95% CI 0.66-0.77) (Stewart et al., 2016).

This study has several limitations, namely mammographic clinic screener not designed to capture information by calculating Six Point Scale and RST in mind, so it is necessary to make some assumptions, in particular, to assume that patients understand that the column labeled "diagnosed before age 50?" refers to the diagnosis of breast cancer. In addition, the screener has no questions about bilateral breast cancer, so it is not possible to calculate a newer version of RST. However, the instrument "Six Point Scale" has the potential to have benefits as a simple assessment tool, which requires minimal time spent by health workers and is low cost.

CONCLUSIONS

The results of the literature review found several instruments that can be used to assess the risk of breast cancer in women. The instruments used are adapted to the existing environmental and cultural conditions. Each instrument has advantages and limitations. In connection with their role, nurses can also develop instruments that can assist in the nursing process, namely the assessment stage. Based on the results of the review, there were no instruments to assess the risk of cervical cancer. Though cervical cancer is one of the causes of death in women after breast cancer. Thus, it is important to be detected using assessment instruments. Assessment instruments can help health workers detect the early risks of cancer in women. With the detection of cancer risk early on, it is expected to increase cancer screening participation in women.

Based on the results of the literature review, several recommendations are recommended as follows it is necessary to develop a six-point scale instrument that is more practical and valid so that the screener no longer makes assumptions for some items. Further research is needed to develop and test the effectiveness of the instrument by using a larger number of samples so that it can be generalized. There were no instruments for assessing cervical cancer risk, so further research is needed

to develop instruments for assessing cervical cancer risk that is appropriate to environmental and cultural conditions in Indonesia.

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