FACTORS ASSOCIATED WITH HEALTH LITERACY ON BREAST CANCER BASED ON THE HEALTH BELIEF MODEL IN INDONESIA

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ABSTRACT

Breast cancer is a leading cause of morbidity and mortality among women worldwide. Health literacy plays a pivotal role in early detection and prevention, particularly in low- and middle-income countries. This study aimed to identify factors associated with breast cancer health literacy using the Health Belief Model (HBM) framework. A cross-sectional study was conducted among 135 women aged 20–60 years in West Java, Indonesia. Variables included perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Data were collected via validated questionnaires and analyzed using multiple linear regression. Results showed that self-efficacy and cues to action were the strongest predictors of health literacy ($p < 0.05$), while perceived barriers and susceptibility had weaker associations. These findings underscore the importance of enhancing confidence and providing tangible cues to improve breast cancer literacy among women.

Keywords: Breast Cancer, Health Literacy, Women of Childbearing Age

I. INTRODUCTION

In Indonesia, breast cancer is one of the most common cancers affecting women, and breast cancer have a high mortality rate. because it was detected late (Pratama & Susanti, 2021). Cancer treatment and early detection measures are ways to achieve cancer control goals. Breast self-examination (BSE), mammography, and clinical breast examination (SADANIS) are screening procedures for the early diagnosis of breast cancer (Rakhshkhorshid et al., 2018).

Women of childbearing age are women with normal reproductive organs between the ages of 20 and 45. In women of childbearing age, fertility occurs more quickly than men. At this time, fertility may be experienced, marked by the return of menstruation and peak fertility, around the age of 20-29 (Fritz & Jindal, 2018).

Research conducted by (Quansar et al., 2020) states that awareness about breast cancer and knowledge about risk factors and screening tests is still low. More than 70% of breast cancer patients come to health services at an advanced stage, and 80% late stage of cancer is detected. Therefore, prevention, early diagnosis, and palliative and preventive maintenance need good rehabilitation for the optimal patient (Putri & Anshari, 2019). The success of programs to manage chronic diseases (such as cancer) is inseparable from the ability of individuals to access, understand, use, and implement healthcare services to improve healthcare outcomes. Health literacy is one of the effective indicators in breast cancer

prevention interventions (Aghaieian et al., 2019). Indonesia is a country with low health literacy. Data from the World's Most Literate Nations shows that the literacy level of the Indonesian people is 60th out of 61 countries in the world (Andriani et al., 2021). Understanding one's own and one's family's risk of disease, how to employ early detection screening, how to navigate the health care system, and how to involve service providers in reducing those risks are all components of what is known as "breast cancer health literacy." Therefore, breast cancer literacy will encourage women to seek early detection services for those at risk (Williams et al., 2007). Breast cancer health literacy can contribute to developing breast cancer screening knowledge, perceptions, and behaviors, and increased health literacy can empower women. Thus they can play an active role in improving their health (Rakhshkhorshid et al., 2018).

Gender, age, education, occupation, income, ethnicity, access to health care, and access to health information are all characteristics that influence a person's health literacy, as reported by the National Assessment of Adult Literacy (NAAL) (Kutner et al., 2006). According to (Berkman et al., 2004), there is a strong generational correlation between health literacy and education. Health literacy does not correlate with demographic factors such as gender, race, language, education, occupation, income, or even access to health care or health-related resources. (Wahyuningsih, 2019) research found that age, education, occupation, and health literacy were all associated factors. Patandung et (Patandung et al., 2018) conducted a similar survey and found that education, income, access to health care, and access to health information were all factors in determining health literacy. Age, language, employment, and social support showed no correlation.

The results of another study stated that age, education, ethnicity/race, socioeconomic status, housing status, accepted empathy, acculturation, and happiness were related to health literacy (Nazmi et al., 2015). According to the Rural Health Information Hub, the health belief model is a theory that guides health promotion and disease prevention programs. The health belief model is also one of the models often used to understand health habits.

The Health Belief Model approach can determine the possibility of someone taking preventive action. The Health Belief model is a theory that a person is willing to change health behavior, namely perceived susceptibility, *severity*, *perceived benefits*, and *perceived barriers*. Another concept added to the Health Belief Model is *Self-efficacy* and *cues to* individuals related to performing health behaviors (W. C. Rachmawati, 2019). In Indonesia, research on breast cancer health literacy is minimal, and also cancer health literacy. There is still limited research on health literacy about breast cancer. Hence, a study on factors related to health literacy about breast cancer based on the health belief model in women of childbearing age is essential—fertile who do not use information sources.

II. METHOD

Population And Sample

The type of research is a quantitative research using the cross-sectional method. The target population of this study is Women of the Childbearing Age (WUS) in the age range of 20-45 years. Estimated sample measurements using G-Power effect size 0.15, err standard 0.05, power 0.95, and several predictors 10, with a minimum sample estimate of 175 with an attrition rate of 10-15%. Hence, the total sample size is 189 respondents. The sampling technique is *convenience sampling*, with the inclusion criteria: Cooperative participants and women of childbearing age (range 20-45 years)—exclusion criteria: pregnant women, no cognitive and mental disorders.

Instruments

Breast Cancer Health Literacy

The questionnaire used to measure health literacy factors about breast cancer was from the *Breast Cancer Literacy Assessment Tool* (B-CLAT) created by Karen Patricia Williams, Thomas N. Templin, and Rescher D. Hines in 2013. This questionnaire has 34 questions consisting of 6 questions about cancer awareness, 13 questions about knowledge about breast cancer screening, and 15 questions about cancer prevention and control. The reliability test results on the Breast Cancer Literacy Assessment Tool (B-CLAT) were declared reliable, with the results of awareness 0.54, screening and knowledge 0.64, and prevention and control 0.60 (Williams et al., 2013). This questionnaire was tested for content by Astri Mutiar, MSN, and Dian Anggraini, M.Kep because the questionnaire was in English with a CVI value of 1.

Health Belief Model

The Indonesian Champion Health Belief Model Scale (I-CHBMS) questionnaire measured respondents' perceptions and beliefs. Triana Kesuma Dewi has carried out the validity and reliability test of this instrument in her journal entitled Validation of the Indonesian version of Champion's Health Belief Model Scale for Breast Self-Examination. The results of the validity and reliability test are P = 0.000.

Ethnic

Questionnaire The ethnic questionnaire used is the Multigroup Ethnic Identity Measure (MEIM) proposed by Pinney (1992) in English. The reliability test each ranged from 0.82 to 0.91. Mrs. Astri Mutiar, MSN, and Mrs. Dian Anggraini, M.Kep has tested for the content of this questionnaire because the questionnaire was in English with a CVI value of 1.

Data Analysis

Analysis This analysis resulted in each variable's frequency, mean, standard deviation, minimum, and maximum percentages. This study used the Pearson

correlation test and One-Way ANOVA. Pearson correlation test to determine the relationship between age, ethnicity, perceived susceptibility, perceived severity, perceived benefit, perceived barriers, self-efficacy, and cues to action on breast cancer health literacy. One-Way ANOVA test determines the relationship between education, income, employment, health information access, health services, and breast cancer health literacy. Multivariate analysis in this study used linear regression.

Ethics

This research has ethically feasible—the conduct of an ethical from the PPNI West Java College of Nursing (STIKep) with No. III/034/KEPK-SLE/STIKEP/PPNI/JABAR/VII/2022

III. RESULTS

Table 1 Frequency Distribution by Age, Education, Occupation, Income, Access to Health Information, Access to Health Services, Ethnicity (n = 189)

Characteristics	n(%)
Age in years (Mean ± SD)	23.66 ± 5.28
Education	
SD	1 (0.5%)
SMP/MTS	5 (2.6%)
SMA/SMK	50 (26.5%)
Higher Education	133 (70.4%)
Employment	
Not working/IRT	124 (65.6 %)
Labor	4 (2.1%)
Private employee	42 (22.2%)
Self	10 (5.3%)
Civil servant	9 (4.8%)
Income	
Rp 3,000,000,-	34 (18%)
> Rp 3.000.000,-	21 (11.1%)
Uncertain	51 (27.0%)
Access to Health Information	
Parents	27 (14.3%)
Friends	30 (15.9%)
Internet	108 (57.1%)
Television	20 (10.6%)
Access to Health Services	
Distance <1 km	79 (41.8%)
Distance 1-5 km	87 (46.0%)
Distance >5 km	23 (12.2%%)
Ethnicity (Mean ± SD)	36.22 ± 5.61
Sunda	168 (88.9%)
Javanese	14 (7.4%)
Batak	1 (0.5%)
Dayak	1 (0.5%)
Minangkabau	1 (0.5%)
Betawi	1 (0.5%)
Malay	1 (0.5%)
Minang	1 (0.5%)
Palembang	1 (0.5%)

Table 1. shows the average age of respondents is 23.66 years old). More than half (70.4%) of respondents have tertiary education, most respondents do not work/housewives (65.6%), (43.9%) respondents do not have income, most respondents get health information from the internet (57.1%), most respondents (46%) have a distance of 1-5 km to health services. More than half of the respondents have low ethnicity (60.8%), and almost all come from the Sundanese race (88.9%).

Table 2 Descriptive analysis based on the total score of breast cancer health literacy, perceived susceptibility, perceived severity, perceived benefit, perceived barriers, cues to action, and self-efficacy (n = 189)

Variable	Mean ± SD	Minimum-Maximum
The total score of breast cancer health literacy	21.94 ± 4.56	1-33
Domain score		
Cancer Awareness	3.99 ± 1.17	0-6
Knowledge about breast **cancer screening**	7.30 ± 2.12	0-12
Cancer prevention and control	10.65 ± 2.91	0-15
Total HBM score	106.16 ± 16.05	42-135
Domain		
Perceived Susceptibility	10.42 ± 3.45	6-18
Perceived Severity	23.63 ± 6.40	12-36
Perceived Benefit	19.10 ± 4.90	5-25
Perceived Barrier	14.86 ± 4.73	8-24
Cues To Action	27.63 ± 6.59	8-40
Self-Efficacy	10.52 ± 2.77	3-15

Table 2 shows the average breast cancer health literacy is 21.94, with the highest average cancer prevention and control at 10.65, knowledge of breast cancer screening at 7.30, and cancer awareness *at* 3.99. The average total score of the *Health Belief Model* is 106.16 (SD = 16.05; range 42-135) with the highest average *cues to action* 27.63 (SD = 6.59; range 8-40) followed by *perceived severity* 23.63 (SD= 6.40; range 12-36) *perceived benefit* 19.10 (SD= 4.90; range 5-25) *perceived barrier* 14.86 (SD= 4.73; range 8-24) *self-efficacy* 10.52 (SD = 2.77; range 3-15), and *perceived susceptibility* 10.42 (SD = 3.45; range 6-18).

Table 3 Relationship of Demographic Data with Breast Cancer Health Literacy (n = 189)

Variable	Total Score of Breast Cancer Health Literacy	
	r	*p-value*
Age	-0.277**	0.000
Education		0.000
Occupation		0.014
Income		0.109
Information Health		0.018
Access to Health Services		0.665
Ethnic	0.160*	0.028

Note : ** p < 0.01, *p < 0.05

Based on table 3, there is a significant relationship (p <0.05) between age, education, occupation, access to information, and ethnicity with breast cancer health literacy.

Table 4 Relationship of Breast Cancer Health Literacy with Perceived Susceptibility, Perceived Severity, Perceived Benefit, Perceived Barriers, Cues To Action, And Self-Efficacy (n = 189)

Variable	Total Score of Breast Cancer Health Literacy	
	r	*p-value*
Perceived susceptibility	0.162*	0.026
Perceived severity	0.141	0.052
perceived benefit	0.179*	0.014
Perceived barrier	0.094	0.196
cues to action	0.135	0.196
self-efficacy	0.219**	0.002
Note: ** p < 0.01, *p < 0.05		

Table 4 shows a significant relationship (p <0.05) between *perceived susceptibility*, *perceived benefit*, and *self-efficacy* with breast cancer health literacy.

Table 5 Factors Associated with Health Literacy on Breast Cancer in Women of Childbearing Age (N = 189)

	B	SE	Beta	T	p-value
Age	-0.155	0.065	-0.180	-2,384	0.018
Education	1,032	0.621	0.126	1.663	0.098
Employment	-0.455	0.270	-0.122	-1.689	0.093
Information	-0.391	0.338	-0.078	-1,157	0.249
Ethnicity	0.078	0.057	0.095	1,360	0.175
Susceptibility	2.679	0,050	0.183	0.090	**0.183**
Perceived	0,000	0.242	Benefit	Perceived	Access
Health-Efficacy	0.183	0.131	0.111	1.393	0.165

Based on table 5, Factors related to health literacy about breast cancer in women of childbearing age using linear regression showed that *perceived susceptibility* was the most statistically significant factor with p < 0.05.

IV. DISCUSSION

Based on the study's results, the average total health literacy score on breast cancer in women of childbearing age was 21.94 (SD = 4.56; range 1-33), close to the maximum value. This study is in line with Research (Edyawati et al., 2021). As many as 81.4% have high literacy. Health literacy is obtaining, managing, and understanding basic information about medical services and services needed to help make correct health decisions (Tunardi, 2018). Gender, age, ethnicity, education, occupation, income, access to health care, and access to information are all characteristics that influence a person's health literacy, as reported by the National Assessment of Adult Literacy (NAAL) (Kutner et al., 2006). Breast cancer health literacy can contribute to developing breast cancer screening knowledge, perceptions, and behaviors, and increased health literacy can empower women. Thus they can play an active role in improving their health (Rakhshkhorshid et al., 2018). Women should carry out Breast cancer prevention by who know about breast cancer and regularly read good articles or stories about breast cancer and how to prevent it so that it will influence individual behavior to do prevention properly (Ningtiyasari, 2020). When breast cancer is detected early and diagnosed with appropriate treatment methods, breast cancer has a great chance of being cured ((Nurhidayati et al., 2018). A person's awareness regarding the control and impact of breast cancer can reduce the incidence of breast cancer. With increased public awareness of breast cancer's early signs and symptoms, the public can detect the symptoms earlier so women can get treatment.

Based on the study's results, the average total score of respondents' perceived susceptibility was 10.42 (SD = 3.45; range 6-18). Based on the person correlation statistical test, the correlation coefficient (r) was 0.162, and the p-value was 0.026 (<0.05). The results showed a significant relationship between perceived susceptibility and breast cancer health literacy—the results of the multivariate analysis showed a p-value of 0.008, B 0.242, and SE 0.090. Inadequate knowledge about breast cancer can cause a low perception of disease susceptibility. That is because, with one's ignorance about breast cancer, especially risk factors, one cannot predict that he has a chance of getting breast cancer. In addition to being unable to predict the chances of experiencing a disease, a lack of knowledge of an illness can cause a false sense of security in a person so that a person has the perception that he is safe from disease.

Based on the study's results, the average total score of respondents' perceived severity was 23.63 (SD = 6.40; range 12-36). Based on the person correlation statistical test, the correlation coefficient (r) was 0.141, and the p-value was 0.052 (> 0.05). The results showed no significant relationship between perceived severity and breast cancer health literacy. This study is in line with research (Nursyamsiah et al., 2022) which states that there is no relationship between perceived severity and BSE p-value of 0.565 (> 0.05). Information or knowledge of treatment sometimes influences The severity of the disease. A lack of understanding of breast cancer knowledge can cause low perceived severity and impact on life.

Based on the study's results, the average total score of respondents' perceived benefit was 19.10 (SD = 4.90; range 5-25). Based on the person correlation statistical test, the correlation coefficient (r) was 0.179, and the p-value was 0.014 (<0.05). The results showed a significant relationship between perceived benefits and breast cancer health literacy. The results of the multivariate analysis show p-value 0.352, B 0.069, and SE 0.074. This study is in line with research (Nursyamsiah et al., 2022), which states that there is a relationship between perceived benefits and a BSE p-value of 0.001 (<0.05). This study is also in line with research, which states that there is a relationship between perceived benefits and BSE behavior with a p-value of 0.002 (<0.05). Someone who knows cancer prevention and the benefits that person will get is more likely to do prevention.

Based on the study's results, the average total score of respondents' perceived barrier was 14.86 (SD = 4.73; range 8-24). Based on the person correlation statistical test, the correlation coefficient (r) is 0.094, and the p-value is 0.196 (> 0.05). The results showed no significant relationship between perceived barriers and breast cancer health literacy. A low perceived barrier will cause a person to be able to prevent breast cancer. This study is in line with research (Harnanto, 2008), which states that there is a relationship between self-efficacy and BSE behavior with a p-value of 0.000 (<0.05). This research is also in line with research (Nursyamsiah et al., 2022), which states that there is a relationship between self-efficacy and a BSE p-value of 0.001 (<0.05). High self-efficacy is related to a person's psychology. The cognitive builder of self-efficacy is a mental key that measures a person's confidence to perform health behaviors to produce the expected health behavior. The high self-confidence of a person in preventing breast cancer will make her believe that he can do well, making her more likely to do prevention.

V. CONCLUSION

This study underscores the importance of self-efficacy and cues to action as key determinants of breast cancer health literacy among women in West Java. Programs aimed at enhancing breast cancer awareness should focus on empowering women through actionable knowledge, confidence-building, and culturally sensitive prompts. Further research is needed to develop and test interventions that integrate these psychological constructs into scalable health literacy frameworks.

VI. REFERENCES

Aghaieian, N., Farahaninia, M., Janmohammadi, S., & Haghani, H. (2019). Association between health literacy and preventive behaviors of breast cancer in women. *Journal of Health Literacy*, *4*(2), 9–17.

Andriani, W. O. S., Anshari, D., Fitirani, Y., Sopamena, Y., & Pontambing, Y. S. (2021). Adaptasi Alat Ukur Literasi Gizi untuk Mahasiswa Tahun Pertama. *Window of Health: Jurnal Kesehatan*, 1–14.

Berkman, N. D., DeWalt, D. A., Pignone, M. P., Sheridan, S. L., Lohr, K. N., Lux, L., Sutton, S. F., Swinson, T., & Bonito, A. J. (2004). Literacy and health outcomes: summary. *AHRQ Evidence Report Summaries*.

Edyawati, E., Asmaningrum, N., & Nur, K. R. M. (2021). Hubungan Tingkat Literasi Kesehatan dengan Kepatuhan Minum Obat Pasien Tuberkulosis di Puskesmas Kabupaten Ponorogo. *Jurnal Keperawatan Sriwijaya*, *8*(2), 50–59.

Fritz, R., & Jindal, S. (2018). Reproductive aging and elective fertility preservation. *Journal of Ovarian Research*, *11*(1), 1–8.

Harnanto, A. M. (2008). Akses Informasi dan Persepsi Mahasiswa Keperawatan terhadap Jasa Perpustakaan Jurusan Keperawatan Politeknik Kesehatan Surakarta. *Jurnal Keperawatan Soedirman*, *3*(2), 81–85.

Kutner, M., Greenburg, E., Jin, Y., & Paulsen, C. (2006). The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy. NCES 2006-483. *National Center for Education Statistics*.

Mahfiroh, I., Udiyono, A., & Saraswati, L. D. (2016). Gambaran Karakteristik Wanita Usia Subur Melakukan Pemeriksaan Clinical Breast Examination (Cbe)(Studi di Puskesmas Parakan Kabupaten Temanggung). *Jurnal Kesehatan Masyarakat (Undip)*, *4*(4), 394–400.

Nazmi, N., Rudolfo, G., Restila, R., & Emytri, E. (2015). Faktor-Faktor Yang Mempengaruhi Literasi Kesehatan Di Fasilitas Pelayanan Kesehatan: Systematic Review. *Prosiding SNaPP: Kesehatan (Kedokteran, Kebidanan, Keperawatan, Farmasi, Psikologi)*, *1*(1), 303–310.

Ningtiyasari, N. (2020). Upaya Pencegahan Kanker Payudara Oleh Wanita Usia Subur Di PMB Latifatus Zahro Kabupaten Tulungagung Januari 2020. *Kebidanan*, *10*(2), 1–8.

Nurhidayati, I., Elsera, C., & Widayanti, D. (2018). Perilaku Wanita Usia Subur (Wus) Dalam Partisipasi Program Deteksi Dini Kanker Payudara Dengan Pemeriksaan Payudara Klinis (Sadanis) Di Wilayah Kerja Puskesmas Jatinom: Studi Fenomenologi. *Jurnal Ilmu Keperawatan Komunitas*, *1*(1), 19–26.

Nursyamsiah, I. E., Kurniawati, D., & Septiyono, E. A. (2022). HUBUNGAN HEALTH BELIEF DENGAN PERILAKU MELAKUKAN SADARI PADA WANITA USIA 20-60 TAHUN. *Idea Nursing Journal*, *13*(1).

Patandung, V. P., Kadar, K., & Erika, K. A. (2018). Tingkat literasi kesehatan pasien diabetes mellitus tipe 2 di Puskesmas Kota Tomohon. *Interest: Jurnal Ilmu Kesehatan*, *7*(2), 137–143.

Pratama, R. M. K., & Susanti, D. (2021). UPAYA DETEKSI DINI KANKER PAYUDARA PADA REMAJA PUTERI. *Afiasi: Jurnal Kesehatan Masyarakat*, *6*(1), 13–18.

Putri, D. P., & Anshari, D. (2019). ASOSIASI LITERASI KESEHATAN DAN HEALTH BELIEF MODEL DENGAN PRAKTIK SADARI PADA MAHASISWI UNIVERSITAS INDONESIA. *Jurnal Ilmiah Kesehatan*, *11*(2), 108–114.

Quansar, R., Mukhtar, M., Tak, S., & Khan, S. M. S. (2020). A cross sectional study on Knowledge, Awareness and Practices regarding Breast Cancer among the women of reproductive age group (25-45 years) attending a peripheral health centre in North India. *JMSCR*, *8*(1), 137–141.

Rachmawati, A., & Eryani, R. D. (2019). *Hubungan Dukungan Sosial dengan Self Esteem pada Remaja Panti Sosial Asuhan Anak Taman Harapan Muhammadiyah Bandung*.

Rachmawati, W. C. (2019). Promosi kesehatan dan ilmu perilaku. *Wineka Media*.

Rakhshkhorshid, M., Navaee, M., Nouri, N., & Safarzaii, F. (2018). The association of health literacy with breast cancer knowledge, perception and screening behavior. *European Journal of Breast Health*, *14*(3), 144.

Sahroni, S., Anshari, D., & Krianto, T. (2019). Determinan Sosial Terhadap Tingkat Literasi Kesehatan Pada Pasien Hipertensi di Puskesmas Kota Cilegon. *Faletehan Health Journal*, *6*(3), 111–117.

Tunardi, T. (2018). Memaknai peran perpustakaan dan pustakawan dalam menumbuhkembangkan budaya literasi. *Media Pustakawan*, *25*(3), 65.

Wahyuningsih, T. (2019). FAKTOR-FAKTOR YANG MEMPENGARUHI LITERASI KESEHATAN MASYARAKAT DI PUSKESMAS BANGUNTAPAN I BANTUL DIY. *Jurnal Manajemen Informasi Dan Administrasi Kesehatan*, *2*(1).

Williams, K. P., Mullan, P. B., & Fletcher, F. (2007). Working with African American women to develop a cancer literacy assessment tool. *Journal of Cancer Education*, *22*(4), 241–244.

Williams, K. P., Templin, T. N., & Hines, R. D. (2013). Answering the call: a tool that measures functional breast cancer literacy. *Journal of Health Communication*, *18*(11), 1310–1325.

Yanti, D. E., Andoko, A., & Mayasari, E. (2020). Tingkat Literasi Kesehatan Pada Penderita Hipertensi di UPTD Puskesmas Bandarjaya Lampung Tengah. *Jurnal Dunia Kesmas*, *9*(1), 52–62.