



Correlation between Visual Analog Scale and Patient Health Questionnaire-9 among Breast Cancer Patient at Islamic Hospital of Malahayati Medan

Rahma Setia Bintang*^{ORCID}, Elmeida Effendy^{ORCID}, Mustafa M. Amin*^{ORCID}

Department of Psychiatry, Universitas Sumatera Utara, Medan, Indonesia

Abstract

Edited by: Branislav Filipović
Citation: Bintang RS, Effendy E, Amin MM. Correlation between Visual Analog Scale and Patient Health Questionnaire-9 among Breast Cancer Patient at Islamic Hospital of Malahayati Medan. Open-Access Maced J Med Sci. 2022 Mar 29; 10(T7):97-99. https://doi.org/10.3889/oamjms.2022.9246
Keywords: Pain; Depression; Breast cancer; Visual analog scale; Patient health questionnaire-9
***Correspondence:** Mustafa M. Amin, Department of Psychiatry, Universitas Sumatera Utara, Medan, Indonesia. E-mail: mustafa.mahmud@usu.ac.id
Received: 27-Dec-2021
Revised: 12-Mar-2022
Accepted: 19-Mar-2022
Copyright: © 2022 Rahma Setia Bintang, Elmeida Effendy, Mustafa M. Amin
Funding: This research did not receive any financial support
Competing Interest: The authors have declared that no competing interest exists
Open Access: This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)

BACKGROUND: The World Health Organization reported that in 2018, the most prevalent cancer cases in Indonesia is breast cancer with a total of 58,256 cases (16.7%) from total cancer cases in Indonesia. Among cancer patients, pain is the most profound and definite effect that has been linked to reduced quality of life as well as the development of depression. In Indonesia, studies investigating the effect of pain among breast cancer patient with depression are still lacking.

AIM: The aim of this study is to investigate the effect of pain with depression among breast cancer patients undergoing chemotherapy at Islamic Hospital of Malahayati Medan.

METHODS: Methods applied in this study were cross-sectional numerical correlative study involved 35 breast cancer patients undergoing chemotherapy at Islamic Hospital of Malahayati Medan age 40–60 years old. To assess pain, we used the visual analog scale (VAS), and as for depression, patient health questionnaire-9 (PHQ-9) was used. Pearson correlation test was used to assess the correlation between pain and depression.

RESULTS: The results showed that most of our subjects graduated from university, are already married and employed. Most are already at the third stadium with VAS score of around 4.89 ± 1.530 indicating moderate pain and PHQ-9 score of 8.23 ± 3.456 indicating mild depression. Pearson test showed $r = 0.511$ (mild strength) indicating that pain severity is correlated positively to depression severity.

CONCLUSION: There is a correlation between VAS score and PHQ-9 score among breast cancer patients undergoing chemotherapy at Islamic Hospital of Malahayati Medan.

Introduction

Breast cancer is known as the leading cause of death among women worldwide, affecting more than 1½ million women from all over the world [1]. It was reported by the World Health Organization that the most prevalent cancer cases in Indonesia are breast cancer with a total of 58,256 cases (16.7%) from total cancer cases in Indonesia. In North Sumatera province, 856 cases of breast cancer were found in 2019 which is the highest number in Indonesia [2]. Earlier studies have shown that pain suffered from cancer has been linked to mood disorders, such as depression, as well as other disorders, including anxiety and somatization. A study by Derogatis *et al.* showed that higher number of cancer patients who are also diagnosed with existing psychiatric disorders experienced severe pain (39%) compared to 19% who are not diagnosed with any psychiatry disorders [3]. Cancer-related pain has been associated with lower quality of life. This also depends on to what extent the individuals internalize and believe that the pain they

suffer is able to alter their daily life which is related to the severity of depression [4]. Thus, our study aims to explore the correlation between pain and depression among women with breast cancer.

Methods

This cross-sectional numerical correlative study took place at the chemotherapy room of Islamic Hospital of Malahayati Medan in November until December 2020. Sample was gathered consecutively using inclusion and exclusion criteria. Our inclusion criteria are as follows; (1) age of 40–60 years old, (2) breast cancer patients undergoing chemotherapy, (3) diagnosed with third stadium breast cancer, and (4) are willing to participate in the study. Patients who are already diagnosed with psychiatry disorders or those with other existing condition causing pain, including migraine, arthritis, and gout are excluded from the study. A total of 35 breast cancer patient were involved in this study. Subjects

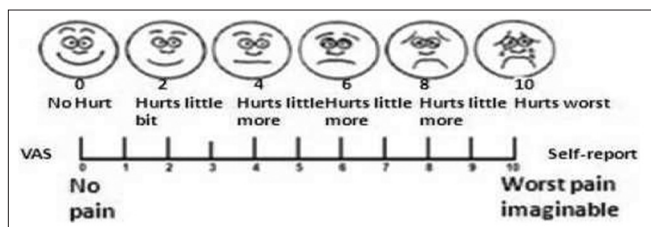


Figure 1: Visual analog scale [6]

were given informed consent before the study and were requested to fill in personal data on participant's form. Direct interview was carried out in accordance with COVID-19 health protocol.

Measurement

Visual analog scale (VAS)

VAS was used to assess intensity of pain in adults, consisting of a 10 cm horizontal line representing the intensity of pain from 0 to 10. Patients are requested to self-mark the number on the scale with pencil in accordance to the pain they experience [5]. VAS score interpretation is in the following:

- 0: No pain
- 1–3: Mild pain, including tingling sensation, itchy
- 4–6: Moderate pain, including numbness
- 7–9: Severe pain that can still be controlled by patient
- 10: Severe pain that can no longer be controlled by patient [6].

Figure 1 is an example of VAS that was used in this study.

Patient health questionnaire-9 (PHQ-9)

PHQ-9 consists of nine question items which are designed to be in accordance with the 4th Diagnostic and Statistical Manual of Mental Disorders criteria of depression. Patients are required to self-report how often that the symptoms present. Score of 0 indicates that the symptoms never happen, 1 means that it appears only a few days, 2 means the symptoms appear to be more than half the days, and 3 indicates that the symptoms appear daily. PHQ-9 score has sensitivity of 88% and specificity 88%. Total score of 5–9 shows mild depression, 10–14 shows moderate depression, 15–19 means nearly severe depression, and 20–27 indicates severe depression [7].

Statistical analysis

We chose to use Shapiro–Wilk test to assess the normality of the data as our sample is quite small of only 35 subjects ($n < 50$). To assess the correlation between VAS and PHQ-9 score, we used Pearson

correlation test as both of our variables are numeric and data distribution was found normal.

Results

As shown in Table 1, average age of our subjects was 49.60 ± 5.957 . Most of them were graduated from university ($n = 15$, 42.9%) and are married ($n = 26$, 74.3%). More than half of the subjects are still employed ($n = 19$, 54.3%) and are diagnosed with third stadium breast cancer ($n = 26$, 74.3%).

Table 1: Demographical characteristics of the subjects

Variables	Value (n = 35)	
	Mean \pm SD	n (%)
Age (year)	49.60 \pm 5.957	
Education		
Junior high school		8 (22.9)
Senior high school		12 (34.3)
University		15 (42.9)
Marital status		
Married		26 (74.3)
Not married		9 (25.7)
Employment		
Yes		19 (54.3)
No		16 (45.7)
Stadium		
III		26 (74.3)
IV		9 (25.7)

We found that average VAS score reported by our subjects was 4.89 ± 1.530 indicating moderate pain (Table 2).

Table 2: VAS score

Variable	n	Mean \pm S.D
VAS score	35	4.89 \pm 1.530

VAS: Visual analog scale.

We also found that average PHQ-9 score of the subjects was 8.23 ± 3.456 indicating mild depression (Table 3).

Table 3: PHQ-9 score

Variable	n	Mean \pm S.D
PHQ-9 score	35	8.23 \pm 3.456

PHQ: Patient health questionnaire.

Pearson correlation test showed that there is a significant positive moderate strength correlation between pain intensity and depression severity ($r = 0.511$, $p = 0.002$) (Table 4).

Table 4: Pearson correlation test of VAS and PHQ-9 score

Variable	mean \pm (S.D)	r	p
VAS	4.89 \pm 1.530	0.511	0.002
PHQ-9	8.23 \pm 3.456		

VAS: Visual analog scale, PHQ: Patient health questionnaire.

Discussion

Cancer-related pain causes debilitating effect that leads to impaired overall quality of life. Despite the numerous innovations in cancer treatment, studies showed that pain has not been

completely resolved yet. In cancer patient, pain may chronically remain which no longer is responsive to certain pain killers. Many of cancer patients can actually be cancer free, but does not directly mean that they will be pain free. This has led to mood disorder, including depression, which sometimes coexists with somatic symptoms [8].

In our study, average age of the subjects is similar to earlier study from Bredal *et al.* that studied about pain among breast cancer patients involving 127 patients with average age of 45 years old. They found that breast cancer patients who are 45 years old are most likely to experience pain (OR: 3.52; 95% CI 1.84–6.73 and $p = 0.0001$) [9]. Same educational level among our subjects is also in line with a study from Lueboonthavatchai in 2007 [10]. Other study also showed similar result of depression severity, as shown in a study by Korzon *et al.* involving 53 breast cancer patients. In their study, they used BPI and HADS-D instead of PHQ-9, yet they also found that mild depression is most prevalent among the patients [11].

Chronic pain is defined as persistent pain that exists for more than three months. It is categorized as nociceptor or neuropathic pain which may coexist in cancer-related pain. Advanced breast cancer usually has already reached other target organs, known as metastasis, that often result in pressure throughout nerve ending, causing pain. In breast cancer, inflammatory cytokines, such as interleukin (IL)-6, IL-1 β , and TNF- α , are increased, thus modulating peripheral nerve ending, producing intense chronic pain. It is also shown to have effect on hippocampus which leads to altered mood through the hypothalamic-hypophyseal-adrenocortical axis. This leads to increased monoamine reuptake that induces depression [12].

Conclusion

There is a correlation between VAS score and PHQ-9 score among breast cancer patients undergoing chemotherapy at Islamic Hospital of Malahayati Medan. Therefore, awareness and early intervention is strongly encouraged.

Declarations

Authors' contributions

All authors contributed equally to this work.

Acknowledgments

The authors express their gratitude to Adam Malik General Hospital, Department of Psychiatry, Faculty of Medicine, Universitas Sumatera Utara, Indonesia, and all the participants of this study.

Ethics approval and consent to participate

The Research Ethics Committee approved this study at the Faculty of Medicine, Universitas Sumatra Utara, with the letter number 650/KEP/USU/2021 on November 24, 2020. All participants write and sign a consent to participate before attending this study. Data will not be shared to respect the privacy of the participant.

References

- Sun YS, Zhao Z, Nv Yang Z, Xu F, Lu HJ, Yong Zhu Z. Factors and Preventions of Breast Cancer. Australia: Ivyspring International Publisher; 2017.
- Kementrian Kesehatan Republik Indonesia, Dikutip Dari. Available from: <https://www.kemkes.go.id/article/view/19020100003/hari-kanker-sedunia-2019.html> [Last accessed on 2021 Nov 11].
- Spiegel D, Sands, Koopman CY. Pain and depression in patients with cancer. *Am Cancer Soc.* 1994;74(9):2.
- Novya DM, Aignerb CJ. The Biopsychosocial Model in Cancer Pain. United States: Wolters Kluwer Health; 2014.
- Sjamsuhidajat R, de Jong W. Buku Ajar Ilmu Bedah. 2nd ed. Kerala: EGC; 2003. p. 395-2.
- Hawker GA, Mian S, Kendzerska T, French M. Measures of adult pain. *Am Coll Rheumatol.* 2011;63:240-52.
- Kroenke K, Spitzer RL, Williams JB. The PHQ-9 validity of a brief depression severity measures. *J Gen Intern Med.* 2001;16(9):608-19. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x> PMID:11556941
- Santiago PO, Melnikov P, de Souza AS, Rigo RS. Pain perception and depression in patients with breast cancer. *Int J Dev Res* 2018;8:4.
- Bredal IS, Smeby NA, Ottesen S, Warncke T, Schlichting E. Chronic Pain in Breast Cancer Survivors: Comparison of Psychosocial, Surgical, and Medical Characteristics Between Survivors With and Without Pain. Netherlands: Elsevier Inc.; 2014. <http://doi.org/10.1016/j.jpainsymman.2013.12.239>
- Lueboonthavatchai P. Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. *J Med Assoc Thai.* 2007;90(10):2164-74. PMID:18041438
- Korzon RH, Szawłowska GC, Landowski J, Majkovicz M. Relationships of anxiety and depressive symptoms with pain perception in post-mastectomy women. An intragroup analysis. *Arch Clin Psychiatry.* 2016;43(4):88. <http://doi.org/10.1590/0101-60830000000088>
- Sheng J, Liu S, Wang Y, Cui R, Zhang X. The link between depression and chronic pain: Neural mechanisms in the brain. *Neural Plast.* 2017;2017:9724371. <https://doi.org/10.1155/2017/9724371> PMID:28706741