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Original Article

Risk Factors Affecting Anxiety and Depression in Malignancy Patients in Makassar

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ABSTRACT

Objective: This study aimed to determine the risk factors that affect anxiety and depression in patients diagnosed with malignancy in Makassar.
Materials and methods: A cross-sectional study was conducted involving 55 patients with malignancy who met the research criteria. Assessment of anxiety and depression was conducted using the GAD-7 and PHQ-9 instruments. The statistical test employed the Chi-Square test. The results were considered significant if the p-value <0.05.
Results: The study found that 49.1% of the patients had anxiety, 61.8% had depression, and 45.5% had a combination of anxiety and depression. The analysis showed a significant relationship between performance status and anxiety ($p<0.01$), performance status and depression ($p<0.05$), as well as performance status with mixed anxiety and depression ($p<0.001$).
Conclusion: The findings of this study suggest that performancee status ECOG ≥3 is a risk factor for anxiety, depression, and both anxiety and depression in patients diagnosed with malignancy.

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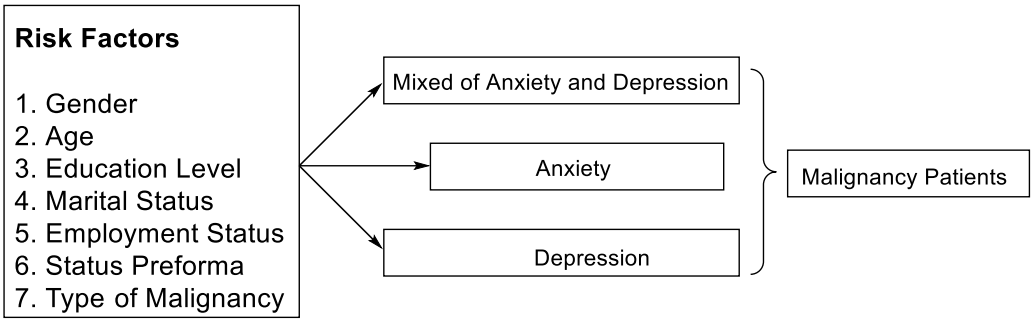
GRAPHICAL ABSTRACT



Introduction

Malignancy disease, commonly referred to as cancer, is a devastating condition characterized by the uncontrolled growth of abnormal cells that lack proper regulatory mechanisms, enabling them to invade surrounding tissues [1]. Malignant disease is a major problem worldwide [2]. According to data from GLOBOCAN, it was estimated that in the year 2020, approximately 19.3 million new cases of malignancies (excluding non-melanoma skin cancer) and nearly 10 million deaths due to malignancy (excluding non-melanoma skin cancer) occurred worldwide [3]. These numbers underscore the immense impact of cancer on individuals and societies worldwide.

In Indonesia, an archipelagic nation with a population exceeding 215 million, malignancy ranks as the 17th leading cause of death. The prevalence of malignancy in Indonesia is notably high at 4.3 cases per 1,000 population [2]. According to Basic Health Research (Riskesdas), the malignancy prevalence in South Sulawesi, a province in Indonesia, is approximately 1.59%, with the highest incidence found among individuals aged 55-64 (4.7%) [4]. The World Health Organization (WHO) reported in 2019 that malignant diseases ranked as the first or the second leading cause of death before the age of 70 in 112 out of 183 countries, further emphasizing its global significance [5].

Beyond its physical toll, malignancy inflicts profound psychosocial challenges on affected individuals. Anxiety and depression stand as the most prevalent psychological problems encountered by malignancy patients[6, 7]. These conditions not only exacerbate the suffering of patients, but are also closely linked to a diminished quality of life. The cancer diagnosis itself can be a source of anxiety and depression, compounding the already arduous journey that patients face. A study conducted by Hong and Tian (2013) [6] in China involving 1,217 patients with solid tumors found that anxiety and depression levels were as high as 6.49% and 66.72%, respectively, within the second week of diagnosis. Similarly, research by Liu *et al.* (2019) [8] reported that 53% of patients newly diagnosed with leukemia experienced depression. A study by Dogu *et al.* (2017) [9] involving patients diagnosed with acute leukemia reported that 38.1% of patients suffered from anxiety, while a staggering 81% grappled with depression. Importantly, untreated mental health disorders in malignancy patients can lead to increased morbidity, decreased treatment adherence, prolonged treatment durations, and more frequent hospitalizations.

Despite the evident psychosocial impact and implications for patient care, routine screening to detect anxiety and depression remains lacking in Indonesia. As such, there is a notable dearth of data regarding anxiety and depression among newly diagnosed malignancy patients, especially in the specific context of Makassar. Furthermore, no prior research has explored the risk factors associated with anxiety and depression among patients diagnosed with malignancy at Wahidin Sudirohusodo Hospital, Makassar. The novelty of this study lies in its unique geographical focus on.

Table 1: Distribution of research variable categories (n = 55) at the outpatient clinic and Hemato-Oncology ward, Wahidin Sudirohusodo Hospital, Makassar

Variables		n	%
Gender	Male	30	54.5
	Female	25	45.5
Age	≤ 45 years old	31	56.4
	> 45years old	25	43.6
Educational Level	≤ 9 years	23	41.8
	> 9 years	32	58.2
Marital Status	Unmarried	13	23.6
	Married	42	76.4
Employment Status	Unemployed	12	21.8
	Employed	43	78.2
Performance Status	≥ 3	9	16.4
	< 3	46	83.6
Type of Malignancy	Solid Tumour	19	34.5
	Hematological Malignancy	36	65.5
Anxiety Status	Yes	27	49.1
	No	28	50.9
Depression Status	Yes	34	61.8
	No	21	38.2
Mixed Anxiety and Depression	Yes	25	45.4
	No	30	54.5

Makassar, its hospital-specific approach at Wahidin Sudirohusodo Hospital, and its urgent mission to bridge the existing gap in data related to anxiety and depression among newly diagnosed malignancy patients. By addressing these specific aspects, this research aims to make a meaningful contribution to the field of oncology and psychosocial care, ultimately enhancing the well-being and treatment outcomes of malignancy patients in this region.

Materials and Methods

This research employed a cross-sectional design. It was conducted at the outpatient clinic and Hemato-Oncology ward, Wahidin Sudirohusodo Hospital, Makassar. The subjects of this study were selected using the consecutive sampling method from patients newly diagnosed with malignancy at the outpatient clinic and Hemato-Oncology ward who met the study criteria. The participants were 18 years old, had agreed to participate and signed the informed consent of the study. They had been diagnosed with primary malignancy and had received information about the diagnosis, treatment plan, and disease prognosis. Patients who were pregnant had a history of psychiatric or mental disorders and were currently taking anti-anxiety and anti-depressant drugs were excluded.

Anxiety and depression were examined using the GAD-7 and PHQ-9 instruments. Subjects were considered to be experiencing anxiety and depression if the total score was 5. After that, data on gender, age, educational level, marital status, employment status, performance status, and type of malignancy were collected.

Data analysis was performed using SPSS. The statistical test used the Chi-Square test. The results were considered significant if the p-value <0.05.

The research protocol has been approved by the Health Research Ethics Committee, Faculty of Medicine, Hasanuddin University Makassar, through the ethical approval recommendation letter number 538/UN4.6.4.5.31/PP36/2020

Results and Discussion

Table 1 indicates 55 research subjects comprised of 30 men (54.5%) and 25 women (45.5%). In terms of age, subjects aged ≤ 45 years were 31 subjects (56.4%), and > 45 years were 24 subjects (43.6%). Based on the educational level,

subjects who had an education level ≤ 9 years were 23 subjects (41.8%), and those with an education level > 9 years were 32 subjects (58.2%). Based on marital status, 13 subjects were unmarried (23.6%) and 42 subjects were married (76.4%). In terms of employment status, 12 subjects were unemployed (21.8%) and 43 subjects (78.2%) were employed. Based on the performance status, 9 subjects (16.4%) had an ECOG value of ≥ 3, and 46 subjects (83.6%) had an ECOG value of < 3. Based on the type of malignancy, 19 subjects have solid tumours (34.5%) and 36 subjects had haematological malignancy (65.5%). Subjects who experienced anxiety were 27 subjects (49.1%) and those who did not experience anxiety were 28 subjects (50.9%). There were 34 subjects (61.8%) who experienced depression and 21 subjects (38.2%) who did not experience depression. Subjects who experienced mixed of anxiety and depression were 25 subjects (45.5%) and 30 subjects did not experience mixed anxiety and depression (54.5%).

Table 2: Relationship between gender, age, educational level, marital status, employment status, performance status, type of malignancy with anxiety at the outpatient clinic and Hemato-Oncology ward, Wahidin Sudirohusodo Hospital, Makassar

Variable			Anxiety		Total	P-value
			Yes	No		
Gender	Male	n	14	16	30	0.694
		%	46.7	53.3	100.0	
	Female	n	13	12	25	
		%	52.0	48.0	100.0	
Age	≤ 45 years old	n	12	19	31	0.080
		%	38.7	61.3	100.0	
	> 45 years old	n	15	9	24	
		%	62.5	37.5	100	
Educational Level	≤ 9 years	n	14	9	23	0.139
		%	60.9	39.1	100.0	
	> 9 years	n	13	19	32	
		%	40.6	59.4	100.0	
Marital Status	Unmarried	n	7	6	13	0.695
		%	53.8	46.2	100.0	
	Married	n	20	22	42	
		%	47.6	52.4	100.0	
Employment Status	Unemployed	n	6	6	12	0.943
		%	50.0	50.0	100.0	
	Employed	n	21	22	43	
		%	48.8	51.2	100.0	
Performance Status	≥ 3	n	9	0	9	0.001
		%	100.0	0.0	100.0	
	< 3	n	18	28	46	
		%	39.1	60.9	100.0	
Type of Malignancy	Solid Tumour	n	6	13	19	0.059
		%	31.6	68.4	100.0	
	Hematological Malignancy	n	21	15	36	
		%	58.3	41.7	100.0	
Total		n	27	28	55	
		%	49.1	50.9	100.0	

Table 3. Relationship between gender, age, educational level, marital status, employment status, performance status, type of malignancy with depression at the outpatient clinic and Hemato-Oncology ward, Wahidin Sudirohusodo Hospital, Makassar

Variable			Depression		Total	P-value
			Yes	No		
Gender	Male	n	20	10	30	0.418
		%	66.7	33.3	100.0	
	Female	n	14	11	25	
		%	56.0	44.0	100.0	
Age	≤ 45 years old	n	20	11	31	0.640
		%	64.5	35.5	100.0	
	> 45 years old	n	14	10	24	
		%	58.3	41.7	100	
Educational Level	≤ 9 years	n	14	9	23	0.902
		%	60.9	39.1	100.0	
	> 9 years	n	20	12	32	
		%	62.5	37.5	100.0	
Marital Status	Unmarried	n	9	4	13	0.529
		%	69.2	30.8	100.0	
	Married	n	25	17	42	
		%	59.5	40.5	100.00	
Employment Status	Unemployed	n	8	4	12	0.696
		%	66.7	33.3	100.0	
	Employed	n	26	17	43	
		%	60.5	39.5	100.0	
Performance Status	≥ 3	n	9	0	9	0.010
		%	100.0	0.0	100.0	
	< 3	n	25	21	46	
		%	54.3	45.7	100.0	
Type of Malignancy	Solid Tumour	n	12	7	19	0.882
		%	63.2	36.8	100.0	
	Hematological Malignancy	n	22	14	36	
		%	61.1	38.9	100.0	
Total			N	21	55	
			%	38.2	100.0	

Performance status influences depression in patients who have been newly diagnosed with malignancy. There was a significant relationship between performance status and depression ($p<0.05$), OR could not be calculated because there was a value of 0. The results indicated that the percentage of depression was higher in performance status ≥ 3 (100.0%) compared to the subjects with performance status < 3 (54.3%) (Table 3).

The distribution of the research variable categories is presented in Table 2. Performance status affects anxiety in patients newly diagnosed with malignancy. There is a significant relationship between performance status and anxiety ($p<0.01$). The results showed that the percentage of anxiety was higher in subjects with performance status ≥ 3 (100%) compared to the subjects with performance status < 3 (39.1%) (Table 2).

Performance status also influences the mix of anxiety and depression in newly diagnosed patients. There was a significant relationship between performance status and mixed anxiety and depression ($p<0.001$), OR could not be calculated because there was a value of 0. The results showed that the percentage of mixed anxiety and depression was higher in performance status ≥ 3 (100.0%) than in subjects with performance status < 3 (34.8%) (Table 4).

Gender, age, education level, marital status, employment status, and type of malignancy did not have a significant relationship with anxiety, depression, and mixed anxiety and depression (Tables 2, 3 and 4).

This study found that the percentage of anxiety, depression, and mixed of anxiety and depression was higher in subjects with performance status ≥ 3 than in subjects with performance status < 3. Statistically, it showed a significant relationship between performance status with anxiety, depression, and both anxiety and depression. Our results are in line with the research of Mystakidou *et al.* (2005) [10] who reported that the percentage of subjects with poor performance status was higher than subjects with good performance status and was statistically significant between performance status with anxiety and a mixed of both (anxiety and depression). Research by Hong and Tian (2013) [6] also reported that there was a statistically significant relationship between performance status with anxiety and depression, where each subject who experienced anxiety and depression was higher in subjects with poor performance status. This study is also in line with research by Chung *et al.* (2018) [11] who reported that there was a statistically significant relationship between poor performance status and anxiety or depression, but subjects who experienced anxiety or depression were higher in subjects with ECOG.

In this study, there was no significant relationship between gender and anxiety, depression and a mixed of anxiety and depression. Our study is in line with the study of Nikbakhsh *et al.* (2014) [12] who also reported that there was no significant relationship between gender and anxiety and depression. In contrast to this study, research by Mystakidou *et al.* (2005) [10] and Linden *et al.* (2012) [13] reported that there was a significant relationship between gender and anxiety. Estrogen and progesterone have a substantial effect on the function of the neurotransmitter system related to anxiety and affect the elimination of fear. Testosterone has an anxiolytic effect by reducing the response to stress and suppressing the activity of the HPA axis. Estrogen receptors also have anxiolytic effects, but some are anxiogenic. For this reason, women tend to experience anxiety more often than men [14-16]. With their femininity, women tend to be more emotional. On the other hand, men with masculinity find it difficult to express emotional distress. Men are less likely to seek help or are more likely to delay seeking help when they have problems with their health, making them more prone to depression [17].

In this study, age did not have a significant relationship with anxiety, depression, and mixed of anxiety and depression. This study is in line with the research of Wiesel *et al.* (2014) [18] who reported that there was no significant relationship between age and anxiety and depression. In contrast to the results of this study, research by Hong and Tian (2013) [6] and Nikbakhsh *et al.* (2014) [12] reported that there was a significant relationship between age and anxiety and depression. Young adult patients with malignancy face various challenges different from emotional feelings that older patients face. This group usually has a role they are just starting to take on at the same time as being diagnosed with malignancy. This is what makes this age group prone to depression [19].

This study found that the educational level did not have a significant relationship with anxiety, depression, and the combination of anxiety and depression. This study is in line with research by Wiesel *et al.* (2014) [18], Hong and Tian (2013) [6] and Nikbakhsh *et al.* (2014) [12] who reported that there was no significant relationship between educational level and anxiety and depression. Research by Chung *et al.* (2018) [11] also reported that there was no significant relationship between education level and anxiety or depression. This study differs from the study by Civilotti *et al.* (2021) [20] who reported a significant relationship between anxiety, depression and both anxiety and depression with educational level. In this study, marital status did not have a significant relationship with anxiety, depression, and mixed of anxiety and depression.

Table 4. Relationship between gender, age, educational level, marital status, employment status, performance status, type of malignancy with mixed of anxiety and depression at the outpatient clinic and Hemato-Oncology ward, Wahidin Sudirohusodo Hospital, Makassar

Variable			Anxiety and Depression		Total	P-value
			Yes	No		
Gender	Male	n	13	17	30	0.729
		%	43.3	56.7	100.0	
	Female	n	12	13	25	
		%	48.0	52.0	100.0	
Age	≤ 45 years old	n	12	19	31	0.254
		%	38.7	61.3	100.0	
	> 45 years old	n	13	11	24	
		%	54.2	45.8	100	
Educational Level	≤ 9 years	n	12	11	23	0.396
		%	52.2	47.8	100.0	
	> 9 years	n	13	19	32	
		%	40.6	59.4	100.0	
Marital Status	Unmarried	n	6	7	13	0.954
		%	46.2	53.8	100.0	
	Married	n	19	23	42	
		%	45.2	54.8	100.00	
Employment Status	Unemployed	n	6	6	12	0.721
		%	50.0	50.0	100.0	
	Employed	n	19	24	43	
		%	44.2	55.8	100.0	
Status Performa	≥ 3	n	9	0	9	0.000
		%	100.0	0.0	100.0	
	< 3	n	16	30	46	
		%	34.8	65.2	100.0	
Type of Malignancy	Solid Tumour	n	6	13	19	0.133
		%	31.6	68.4	100.0	
	Hematological Malignancy	n	19	17	36	
		%	52.8	47.2	100.0	
Total		N	25	30	55	
		%	45.5	54.5	100.0	

This study is in line with research by Mystakidou *et al.* (2005) [10] who reported that there was no significant relationship between marital status and depression and a combination of both anxiety and depression. Research by Nikbakhsh *et al.* (2014) [12] also reported that there was no significant relationship between marital status and anxiety and depression. This study differs from the study by Civilotti *et al.* (2021) [20] who reported a significant relationship between anxiety, depression and the combination of anxiety and depression with marital status. For malignancy patients, having a partner who can provide support, share emotions, discuss, decide, and deal with repeated visits and lengthy treatments can be a source of energy (spirit) in itself [20]. Strong emotional support from a partner can be a protective factor against developing anxiety and depression [21].

In this study, it was found that work status did not have a significant relationship with anxiety, depression, and the combination of anxiety and depression. Research by Chung *et al.* (2018) [11] also reported that there was no significant

relationship between work status and anxiety or depression.

Unemployment status in patients with malignancy can trigger anxiety and depression. The expenses that must be paid by patients, if they do not have health insurance (for paying hospital care, transportation, daily meals, and medicine), lead to the thought that they will become a burden to the family [22, 23].

In this study, the type of malignancy did not have a significant relationship with anxiety, depression and the combination of both (anxiety and depression). This study is in line with Linden *et al.* (2012) [13] who also reported that there was no significant relationship between the type of malignancy and anxiety. When a haematological malignancy is diagnosed, the patient will feel sad and be worried, which is a normal stress response to malignancy [13]. Because haematology patients sometimes do not feel "sick" (most are diagnosed based on routine examination results), they will feel acute stress when listening to the explanation of the diagnosis and treatment as well as length of treatment. Acute stress can activate the HPA axis [24]. Research by Sewtz *et al.* (2020) [25] reported that there was no significant relationship between the type of malignancy and anxiety and depression. Solid tumors can cause depression directly due to the presence of pro-inflammatory cytokines produced by the tumor, which then activates the HPA axis ultimately reducing serotonin levels, causing depression [26, 27]. The depression prevalence can be different in patients with different tumor locations.

Conclusion

Performance status ECOG ≥ 3 affects anxiety, depression, and both anxiety and depression in patients diagnosed with malignancy. These findings underscore the importance of expert intervention and holistic care to address the psychosocial challenges faced by malignancy patients, particularly focusing on performance status as a critical factor in improving their overall quality of life.

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Authors' Contributions

All authors contributed to data analysis, drafting, and revising of the article and agreed to be responsible for all the aspects of this work.

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