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Social support, physical and mental health, and alcohol and tobacco use in cancer patients in the State of Mato Grosso, Brazil

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ABSTRACT. This study aimed to examine the association between sociodemographic characteristics and extremes of social support in patients with cancer in the state of Mato Grosso. This study compared the levels of social support (high and low) with patients' physical and mental health, as well as their alcohol and/or tobacco use. Method: Cross-sectional study with 765 patients undergoing cancer treatment in Mato Grosso, Brazil, from 2019 to 2021. This study examined sociodemographic data, information about physical and mental health, patterns of alcohol and tobacco use, and social support. Poor social support was defined as having an MOS-SSS score below the 25 percentile for the entire sample. Results: As expected, individuals with a high level of social support exhibited better mental health and reduced alcohol and tobacco use. Conversely, individuals with smaller social networks and no religious affiliation had lower levels of social support and were more prone to depressive symptoms, suicidal thoughts, respiratory diseases, and metastasis. However, patients with a low level of social support had a lower-than-expected level of alcohol/tobacco use. In addition, contrary to previous studies, participants with high social support did not engage in binge drinking to the same extent as expected. Conclusion: Health professionals in oncology services must be aware of mental health problems, particularly substance use, and of the importance of monitoring social support in this population.

Keywords: cross-sectional studies; social support; mental health; ethanol; tobacco products; neoplasms.

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Introduction

Cancer is a progressive and debilitating disease that profoundly affects the quality of life and well-being of individuals and contributes to high rates of premature mortality (Bray et al., 2018; Instituto Nacional de Câncer José Alencar Gomes da Silva, 2022; World Health Organization, 2022). It represents a significant proportion of the global disease burden, with a particularly high prevalence in low- and middle-income countries (Bray, 2014; Shah et al., 2019). The disease disproportionately affects populations in vulnerable socio-economic conditions, characterized by low social support and limited access to healthcare (Devarapalli et al., 2018; Pan American Health Organization, 2022).

In Brazil, cancer is a major public health concern. According to the National Cancer Institute, the country recorded approximately 704,000 new cases of cancer in 2022-2025, for each year of the triennium, with an increasing prevalence in all regions, including the state of Mato Grosso. This highlights the pressing need to enhance cancer care and address psychosocial dimensions of treatment, especially in regions with limited resources. The integration of social support strategies is imperative to improve the quality of life and outcomes of cancer patients, especially in areas where health services may be under-resourced (Instituto Nacional de Câncer José Alencar Gomes da Silva, 2022).

The etiology of cancer is multifactorial, with modifiable health behaviors playing a prominent role (International Agency for Research on Cancer, 2022). Among these behaviors, continued alcohol and tobacco use are strongly associated with tumor recurrence, the development of secondary primary tumors, and a range of adverse psychosocial outcomes, including increased psychological distress and decreased quality of life (Ehrenzeller et al., 2018; Jiang et al., 2018; Howren et al., 2022). In the United States, over 40% of newly

diagnosed cancer cases in 2014 were attributed to modifiable lifestyle factors (Islami et al., 2018). In Canada, estimates indicate that 40,000 cancer cases could be prevented annually by 2042 if exposure to modifiable risk factors were reduced (Poirier et al., 2019).

Awareness of these risk factors plays a critical role in promoting healthier behaviors and potentially mitigating disease progression. It also contributes to a heightened sense of risk awareness, promotes self-care, facilitates early diagnosis, and reduces the overall harm caused by cancer (World Health Organization, 2022; Pan American Health Organization, 2020). Moreover, cancer is often associated with stigma and significant social burdens (Stewart & Wild, 2014), which contribute to psychological distress, including feelings of anxiety, stress, hopelessness, dissatisfaction with body image, and existential fear about the future (Ambrósio & Santos, 2015). These psychosocial challenges are frequently compounded by increased substance use, particularly alcohol and tobacco (Cancer Center Cessation Initiative Family and Social Support Systems Working Group, 2021), and an increased risk of depression and suicide (Tsaras et al., 2018; Naser et al., 2021; Zamanian et al., 2021).

The diagnosis and treatment of cancer are inherently stressful and influenced by a complex interplay of biopsychosocial factors. These factors have detrimental effects on both patients' physical health and their broader social environment (Ernst et al., 2019). Social support is a critical resource for mitigating the psychological impact of cancer and its treatment (Steel et al., 2004; Ciria-Suarez et al., 2021).

Social support is defined as assistance provided by a network of individuals through interpersonal connections and communicative exchanges, which collectively contribute to psychological and physical well-being over time (Donovan & Greenwell, 2021). Recent findings have underscored the beneficial impact of social support on cancer treatment, highlighting its role in managing symptoms and enhancing overall care quality (Adam & Koranteng, 2020). While social support is universally recognized as a valuable resource, its interpretation and impact can vary significantly across different cultural contexts and individual experiences (International Agency for Research on Cancer, 2022). A growing body of literature highlights the beneficial effects of high social support on cancer patients (Jiang et al., 2018; Park et al., 2021; Howren et al., 2022).

The protective benefits of social support in the context of various illnesses—such as COVID-19, diabetes, depression, and suicidal ideation—are well documented (Alsubaie et al., 2019; Grey et al., 2020; Poudel et al., 2020; Rubio et al., 2020). A similar protective effect has been observed in cancer patients, where perceived high levels of social support have been associated with improved psychological outcomes (Faraci et al., 2021). Conversely, the detrimental effects of low social support in terms of morbidity and mortality have been well recognized (Coughlin, 2020). Although numerous studies have examined the role of social support in cancer patients, most have focused on biological outcomes (Adam & Koranteng, 2020) or quality of life (Shen et al., 2020; Zhang et al., 2020; Ban et al., 2021). However, research specifically exploring the intersection of social support and substance use among patients with cancer remains limited.

Tobacco and alcohol consumption are widely acknowledged as major health risks that contribute to the development of chronic non-communicable diseases (NCDs), including cancer (Mitchell et al., 2014; Dal Maso et al., 2016). These substances have been definitively linked to an elevated risk of mortality; in Brazil, for instance, alcohol was responsible for 8.7% of cancer deaths in 2016, whereas smoking accounted for 21.2% of cancer deaths in 2017 (World Health Organization, 2022).

The relationship between alcohol and tobacco consumption and cancer mortality is well-established, with greater lifetime consumption correlating with an elevated risk of developing cancer (Jiang et al., 2018; Rumgay et al., 2021). Moreover, continued use of these substances following cancer diagnosis has been associated with an increased risk of cancer recurrence, development of secondary primary tumors, significant comorbidities, and poorer psychosocial outcomes, including depression, as well as a decline in well-being and quality of life (Howren et al., 2022).

The present study sought to investigate the sociodemographic characteristics and extremes of social support among cancer patients in the state of Mato Grosso. This study compared high and low levels of social support with physical and mental health and the use of alcohol and/or tobacco.

Methods

This quantitative cross-sectional study was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) (Von Elmet al., 2008). This study is part of a larger study entitled “Cancer and its associated factors: analysis of population-based and hospital records in Mato Grosso”

(Galvão et al., 2022). The study was carried out in two large referral hospitals for cancer treatment in the state of Mato Grosso, Brazil (Galvão et al., 2022). The final sample for this study comprised 765 participants, who were selected through purposive sampling. The participants were classified based on perceived social support (high and low), meaning those with a percentile above and below 25 on the Social Support Assessment Instrument (MOS-SSS)(Shin et al., 2008). The methodology employed for data collection and analysis is described in Galvão et al. (2022). The research team comprised highly qualified professionals who had undergone proper training and were hailed from higher education institutions, research centers, and health services focused on cancer treatment and research (more details in Galvão et al., 2022).

Ethics Aspects

This research was endorsed by the Ethics Committee in Research with Human Beings of the Hospital Universitário Júlio Muller - HUJM, Cuiabá, Brazil, under opinion number: 3.048.183 and CAAE: 98150718.1.0000.8124 of 11/20/2018, and CEP SES-MT 3.263.744, following the ethical principles advocated in Resolution 462/2012, of the Brazilian National Health Council, on research involving human beings.

Results

Table 1 lists the sociodemographic characteristics of the 765 patients diagnosed with cancer and undergoing treatment at the two reference hospitals. Most were female 418 (55.2%), 403 (53.3%) were 19-59 years old, 535 (70.7%) were of non-white ethnicity/ color, 434 (57.4%) were married/consensual union, 322 (42.6%) had a low level of education (< 8 years), 691 (91.4%) declared themselves as religious, 421 (55.7%) earned less than the minimum wage, 383 (50.6%) belonged to social class C, 242 (32.0%) lived with up to two people in the household home, and 443 (59.3%) lived in an urban area.

Table 1. Sociodemographic information and social support of people with cancer in the state of Mato Grosso, Brazil, 2021.

Variable	Category	Social Support High	Total Low	Total	Δ	IC95%	p-value
Gender‡	Male	211 (60.8)	136 (39.2)	347 (100.0)	21.6	(14.3; 28.8)	< 0.001*
	Female	211 (50.5)	207 (49.5)	418 (100.0)	0.96	(-5.8; 7.7)	0.782
Age‡	19-59 years	206 (51.1)	197 (48.8)	403 (100.0)	2.2	(-4.6; 9.1)	0.526
	> 60 years	216 (59.7)	146 (40.3)	362 (100.0)	19.3	(12.9; 26.5)	< 0.001*
Ethnicity‡	White	133 (60.2)	88 (39.82)	221 (100.0)	20.3	(11.2; 29.5)	< 0.001*
	Non-white	281 (52.5)	254 (47.5)	535 (100.0)	5.0	(-0.94; 11.0)	0.098
Marital status‡	Single	160 (48.3)	171 (51.6)	331 (100.0)	-3.3	(-10.9; 4.3)	0.392
	Partner	262 (60.4)	172 (39.6)	434 (100.0)	20.7	(14.2; 27.2)	< 0.001*
Education‡	< 8	265 (59.9)	177 (40.0)	442 (100.0)	19.9	(13.4; 26.4)	< 0.001*
	> 8	156 (48.4)	166 (51.5)	322 (100.0)	-3.1	(-10.8 ; 4.6)	0.430
Religion‡	Yes	396 (57.3)	295 (42.7)	691 (100.0)	14.6	(9.4; 19.8)	< 0.001*
	No	26 (35.62)	47 (64.4)	73 (100.0)	-28.7	(-44.3; -13.2)	< 0.001*
Income (MW) ‡	< 1	223 (52.9)	198 (47.0)	421 (100.0)	5.9	(-0.80; 12.7)	0.084
	> 1 < 2	89 (60.1)	59 (39.8)	148 100.0)	20.3	(9.1; 31.4)	< 0.001*
	⩾ 2	76 (54.7)	63 (45.3)	139 (100.0)	9.3	(-2.3; 21.0)	0.117
Social class‡	A-B	91 (57.6)	67 (42.4)	158 (100.0)	15.2	(4.3; 26.1)	0.006*
	C	207 (54.0)	176 (45.9)	383 (100.0)	8.1	(1.0; 15.1)	0.025*
	D-E	124 (55.3)	100 (44.6)	224 (100.0)	10.7	(1.5; 19.9)	0.023*
Number of people living in the household‡	1	48 (40.0)	72 (60.0)	120 (100.0)	-20.0	(-32.4; -7.6)	0.002*
	2	132 (54.5)	110 (45.4)	242 (100.0)	9.10	(0.22; 17.9)	0.045*
	3	92 (57.5)	68 (42.5)	160 (100.0)	15.0	(4.2; 25.8)	0.007*
	4	81 (61.8)	50 (38.2)	131 (100.0)	23.6	(11.9; 35.4)	< 0.001*
	5 ou +	66 (61.7)	41 (38.3)	107 100.0)	23.3	(10.3; 36.4)	< 0.001*

‡Chi-squared test. Δ: Difference in proportions; 95% CI: 95% confidence interval for the difference in proportions; *P value <0.05. (n = 756) MW: minimum wage = value in BRL (1 US$ = 4.0, BRL 998.00, equivalent to US$ 249.5).

According to the Medical Outcomes Study Social Support Survey (MOS-SSS), participants were divided into two groups according to their level of social support: 422 (55.2%) with high social support and 343 (44.8%) with low social support. In the bivariate analysis, among participants with cancer classified as having low social support, 207 (39.2%) were female, 197 (48.9%) were 19-59 years old, 171 (51.6%) did not have a partner, 166 (51.5%) had a higher level of education (> 8 years), 72 (60.0%) lived with a smaller number of people in the household (one), and 47 (64.4%) declared themselves as not religious ($p < 0.05$) (data not shown).

In the group of participants with high support, it is worth noting some differences: being male stands out ($p < 0.001$), elderly (age ⩾ 60 years) ($p < 0.001$), ethnically white ($p < 0.001$), married/consensual union ($p < 0.001$), with a low level of education (< 8 years) ($p < 0.001$), religious ($p < 0.001$), low income (earning−1-2 minimum wages) ($p < 0.001$), from all social classes ($p < 0.05$), living with a larger number of people in the household (two or more) ($p < 0.05$).

The characteristics of health status are presented in Table 2. Among the participants, 403 (53.3%) rated their health as fair or poor, 117 (15.5%) were classified as having symptoms of depression (PHQ-2), 54 (7.1%) had suicidal thoughts, 214 (28.3%) had received at least two treatments for cancer, 585 (77.3%) were at the beginning of treatment, 72 (9.5%) were diagnosed with respiratory disease, and 180 (23.8%) had metastases (Table 2). Of the total, 101 (13.2%) had tumor recurrence and regarding the clinical stage of the disease (I-IV): 144 (18.8%) II, 201 (26.3%) III, 155 (20.3%) IV, and 180 (23.5%) were in the diagnostic stage (data not shown).

The bivariate analysis showed that participants with high social support had better health status (physical and mental) and were engaged in treatment. Of these, 226 (62.4%) rated their health as good or very good, 371 (57.4%) did not have depressive symptoms, 403 (57.2%) did not report suicidal thoughts, 86 (60.1%) had undergone four or more treatments for their cancer, and had no diagnosis of respiratory disease ($p < 0.001$). Low social support was significantly higher ($p < 0.05$) among those with positive symptoms of depression 68 (58.1%), suicidal ideation (72.2%), respiratory diseases (68.0%), and metastasis 123 (68.3%).

Table 2. Health status and social support in people with cancer in the state of Mato Grosso, Brazil, 2021.

Variable	Category	Social Support		Total	Δ	95% CI	p-value
		High	Low				
Health assessment‡	Good/ Very good	226 (62.4)	136 (37.6)	362 (100.0)	24.8	(17.8; 31.9)	< 0.001*
	Regular/ poor	196 (48.6)	207 (51.3)	403 (100.0)	-2.7	(-9.6; 4.2)	0.438
Depression (PHQ-2) ǂ	Positive	49 (41.8)	68 (58.1)	117 (100.0)	-16.2	(-28.8; -3.6)	0.012*
	Negative	371 (57.4)	275 (42.5)	646 (100.0)	14.8	(9.5; 20.2)	< 0.001*
Suicidal ideation‡	Yes	15 (27.8)	39 (72.2)	54 (100.0)	-44.4	(-61.3; -27.5)	< 0.001*
	No	403 (57.2)	301 (42.7)	704 (100.0)	13.5	(9.2; 19.6)	< 0.001*
Number of treatment procedures‡	1	94 (46.5)	108 (53.5)	202 (100.0)	-6.9	(-16.6; 2.8)	0.163
	2	126 (58.8)	88 (41.1)	214 (100.0)	17.7	(8.4; 28.0)	< 0.001*
	3	113 (57.6)	83 (42.3)	196 (100.0)	15.3	(5.5; 26.0)	0.002*
	4 +	86 (60.1)	57 (39.8)	143 100.0)	20.3	(8.9; 31.6)	< 0.001*
Started first treatment‡	Yes	123 (68.3)	57 (31.7)	180 (100.0)	36.66	(27.0; 46.3)	< 0.001*
	No	299 (51.1)	286 (48.9)	585 (100.0)	2.2	(-3.5; 7.9)	0.447
Respiratory disease ǂ	Yes	23 (31.9)	49 (68.0)	72 (100.00)	-36.1	(-51.3; -20.8)	< 0.001*
	No	398 (57.5)	294 (42.5)	692 (100.0)	15.0	(9.8; 20.2)	< 0.001*
Evolution of disease/ Metastasis ǂ	Yes	57 (31.7)	123 (68.3)	180 (100.0)	-36.7	(-46.3; -27.0)	< 0.001*
	No	286 (48.9)	299 (51.1)	585 (100.0)	-2.2	(-7.95; 3.51)	0.483

ǂChi-squared test. Δ: Difference in proportions; 95% CI: 95% confidence interval for the difference in proportions; *P value < 0.05. (n = 756).

Regarding tobacco use, 63 (7.9%) were active smokers, 294 (38.8%) had smoked in their lifetime, and 408 (53.4%) had never smoked. Among regular smokers (for at least five years), the median age at smoking initiation was 15 years (range, 6–64 years).

No differences were observed in the level of social support among smokers, non-smokers, or ex-smokers ($p > 0.05$). Regarding differences in sample proportions, as noted in Table 3, participants who were classified as having high levels of social support smoked in their lifetime ($p < 0.001$) and were abstinent from alcohol ($p < 0.001$). Simultaneously, 367 (55.9%) patients classified as having low social support did not binge drink alcohol ($p < 0.001$).

Table 3. Use of alcohol or tobacco and social support in people with cancer in the state of Mato Grosso, Brazil, 2021.

Variable	Category	Social support		Total	Δ	95% CI	p-value
		High	Low				
Lifetime tobacco use‡	Yes	207 (57.9)	150 (42.0)	357 (100.0)	15.96	(8.7; 23.2)	< 0.001*
	No	215 (52.7)	193 (47.3)	408 (100.0)	5.40	(-1.4; 12.2)	0.123
Lifetime alcohol use‡	Yes	55 (50.46)	54 (49.5)	109 (100.0)	0.92	(-12.3; 14.2)	0.892
	No	367 (56.0)	288 (43.9)	655 (100.0)	12.06	(6.7; 17.4)	< 0.001*
Binge drinking‡	Yes	54 (49.5)	55 (50.4)	109 (100.0)	-0.92	(-14.2; 12.3)	0.892
	No	289 (44.0)	367 (55.9)	656 (100.0)	-11.9	(-17.2; -6.5)	< 0.001*

ǂChi-squared test. Δ: Difference in proportions; 95% CI: 95% confidence interval for the difference in proportions; *P value < 0.05. EF: Fisher's exact test. (n = 756).

Table 3 shows that 109 (14.4%) participants had a lifetime history of alcohol use, and most were abstainers (86.6%). The mean age at onset of drinking was 20.7 years (95% CI 19.4; 22.0), ranging from 12 to 50 years. Regarding drinking patterns, 55 (50.4%) patients drank alcohol monthly, 43 (39.4%) drank alcohol less than monthly, and 6 (1.4%) drank alcohol weekly.

Discussion

To the best of our knowledge, this is the first study to evaluate the characteristics of patients undergoing cancer treatment in the state of Mato Grosso. The study compared the levels of social support (high and low) with physical and mental health and alcohol and/or tobacco use. As expected, people with high levels of social support had better mental health and lower alcohol and tobacco use. Patients with smaller social networks and no religion had low levels of social support, depressive symptoms, suicidal thoughts, respiratory disease, and metastasis. However, those with low levels of social support had lower-than-expected levels of alcohol/tobacco use. In addition, contrary to previous studies, participants in the high social support group did not binge drink as much as expected (Yang et al., 2013; Rodríguez-González, Ramos-Monserrat and Arriba-Fernández, 2023).

More than half of the participants (55.2%) were classified as having a high level of social support, had better mental health, and used less alcohol/tobacco. Among those with low social support, there was a higher prevalence of patients with fewer people in the family, who did not consider themselves religious, had more depression and suicidal thoughts, and had more physical health problems (e.g., respiratory disease and metastases).

A meta-analysis study on social networks and cancer mortality highlighted that a lower risk of mortality may be related to several mechanisms, such as being married or in a stable relationship, and living in an environment with a larger network of people, which provides an increased level of social support (Kroenkeet al., 2017). Another important finding from the current study was that patients with higher levels of social support had better physical and mental health, were already receiving treatment, rated their health as good or very good, did not have depressive symptoms, did not have suicidal ideation, and had undergone more treatment procedures.

Studying the relationship between perceived social support and mental health in cancer patients is not new. Although this area has been well researched, the results have been inconsistent, highlighting that in addition to lower perceived social support from family and friends, outcomes such as suicidal behavior and ideation, anxiety, and depression are exacerbated in cancer patients (Balcı Şengül et al., 2014).

In low-income countries, a Peruvian study of 254 women newly diagnosed with breast cancer found that the majority were single, had secondary education, were not working, and 25.6% had depression. However, the odds of these women having depressive symptoms and suicidal ideation are significantly reduced by having a partner or being employed (Casavilca-Zambrano et al., 2020).

However, the findings of the above-mentioned study were contradicted by a Chinese study that compared the effects and differences in perceived social support and depressive symptoms of cancer survivors and non-cancer individuals. Patients with cancer reported greater perceived social support than the general population; however, patients with cancer were more prone to depression (Yooet al., 2017). Another study (Zhao et al., 2021) found that perceived social support had a direct positive effect on depression, with an emphasis on family support, and consequently, a greater likelihood of increasing hope and resilience, which, in turn, reduced depressive symptoms in men being treated for prostate cancer.

However, it is important to note that not all patients with low social support necessarily want more support. Studies have examined emotional distress in newly diagnosed cancer patients by comparing low and high perceived support with low and high desired support (Linden & Vodermaier, 2012; Vodermaier & Linden, 2019). The studies showed that cancer patients with a low desire for social support at the time of diagnosis did not have clinically relevant anxiety and depressive symptoms, regardless of whether they perceived that they had social support. Cancer patients with a high desire for social support but who did not receive much support experienced the highest levels of emotional distress, reaching clinical levels of anxiety and/or depressive disorder. The conclusion is that healthcare professionals must routinely seek to understand cancer patients' needs for perceived and desired social support to avoid a potential waste of resources and no detriment to the patient's well-being.

Social support for cancer patients is a key resource in coping strategies for managing and alleviating psychological distress through active coping, positive reframing, and acceptance(Zamanian et al., 2021).

Therefore, it needs to be measured and well evaluated so that it can be used as a fundamental strategy for supporting patients undergoing cancer treatment.

Alcohol and tobacco use

It is worth noting that it was expected that the prevalence of alcohol and/or tobacco use would be higher in patients with low social support. However, in this study, low levels of lifetime alcohol and tobacco use were observed. Additionally, there was a low level of binge drinking among those with high social support, whereas previous studies have found a high prevalence of binge drinking among cancer patients with high social support (McCarter et al., 2018; Cancer Center Cessation Initiative Family and Social Support Systems Working Group, 2021).

Hypothetically, the low prevalence of smoking could be related to the government's national tobacco control policies in recent decades, such as anti-smoking advertisements and health consequences in different media, showing the impact of smoking on the development of diseases including cancer, in addition to taxing cigarette prices and banning sales to minors (Brasil, 2021). However, similar policies have not been as effective in addressing alcohol concerns despite large investments.

Despite the severity, the prevalence remains remarkably high. Research suggests that approximately one-third of cancer patients, particularly those with head and neck malignancies (McCarter et al., 2018) and those in the early stages of treatment (Howren et al., 2022) in U.S. healthcare settings, use tobacco and/or consume alcohol at hazardous levels, including binge drinking. When a smoker is also a drinker, the likelihood of developing smoking-related cancer increases fivefold (Brasil, 2016; McCarter et al., 2018; Brasil, 2021; World Health Organization, 2021; Pan American Health Organization, 2022). Continued use after a cancer diagnosis is associated with poorer prognosis, such as tumor recurrence, metastasis, and poor psychosocial outcomes, which reduce the well-being and quality of life of cancer patients (Jiang et al., 2018; Rumgayet al., 2021; Howrenet al., 2022). In addition to alcohol and tobacco use, the future burden of tobacco- and alcohol-related cancers is expected to increase substantially based on demographic effects in areas with low purchasing power and precarious living conditions, with a 69.9% increase in tobacco-related cancers and 68% increase in alcohol-related cancers (Lee & Hashibe, 2014).

Treatment of nicotine dependence is challenging in the oncology population because of the chronicity of substance use, anxiety, and depression (Yang et al., 2013; Ehrenzeller et al., 2018; Naser et al., 2021). Internationally, there is a high prevalence of relapse and discontinuation of smoking cessation programs among people with cancer. Yang and colleagues (Yang et al., 2013) studied 493 people undergoing cancer treatment and found that 26.6% continued to smoke after starting the treatment. Those with higher social support quit smoking, demonstrating that social support is an important factor for smoking cessation and abstinence. In addition, this study confirmed that cancer survivors with low social support are more likely to continue smoking. Understanding the prevalence and socioeconomic characteristics of cancer survivors who continue to smoke and consume alcohol is paramount for implementing smoking cessation interventions. A systematic review identified variables between survivors who continued to smoke and those who successfully quit smoking and found that younger female patients, those without a partner, and those with less socioeconomic and psychosocial support were more likely to continue smoking after a cancer diagnosis (Ehrenzeller et al., 2018).

In addition to the causal relationship between alcohol and/or tobacco use and the potential risk of disease, which is 30 times higher among these users (Instituto Nacional de Câncer José Alencar Gomes da Silva, 2019; Rock et al., 2020), cancer does not always serve as a strong motivator for behavioral change and cessation (Strecket al., 2021). Even with the low consumption rates observed in our sample, unhealthy behaviors tend to persist after a cancer diagnosis, depending on sociodemographic, clinical, and psychological aspects as well as the type of treatment. Therefore, helping patients change such behaviors and maintain abstinence plays an important role for health professionals at all stages of cancer treatment (Di Meglioet al., 2021). The following smoking cessation strategies have been shown to be effective for cancer patients: counseling for the patient and peers to assess barriers and motivation to quit, pharmacotherapy, and monitoring and evaluation in an individualized and comprehensive manner (Ehrenzelleret al., 2018).

The involvement of people from support networks is essential for cancer patients who use alcohol and tobacco. Although support networks are not commonly considered, failure to do so compromises the treatment success. Brief and motivational interventions, in addition to involving family members and/or

caregivers, are fundamental to helping cancer patients stop using substances (Cancer Center Cessation Initiative Family and Social Support Systems Working Group, 2021).

Limitations

A limitation of the study is its cross-sectional methodological design, which makes it impossible to determine cause-and-effect relationships regarding social support and identify factors that may confound reversibility in the causal interpretation of the results. In addition, the data were mainly obtained through interviews using a questionnaire; therefore, there was a possibility of recall bias. The prevalence of alcohol and tobacco use may be underestimated because of patients' fear of being judged when interviewed by health professionals.

Implications for practice

The main implication for clinical practice is to address and understand the intersection between social support for people with cancer and the care of health professionals, so that there is a greater focus on social support for cancer patients, with particular reference to how social support helps mental health and alcohol/tobacco use.

Oncology teams need to be skilled in their cognitive and relational skills, and aware of the resources available to help these individuals change their behaviors through intervention strategies, counseling for cancer survivors according to the type of cancer and stage of the disease, treatment, side effects and drug interactions, risk factors for recurrence or new primary cancers, and comorbid conditions (Lucchiari et al., 2016). These findings may help health professionals and oncology services reflect on and discuss professional and care practices related to mental health, particularly substance use, and the importance of monitoring social support. Assessment of mental health in cancer patients should be considered routine, as should the ongoing monitoring of alcohol and tobacco use.

Conclusion

The findings of this study highlight that cancer patients with higher levels of social support have better mental health and lower alcohol and tobacco use, whereas those with reduced social networks and no religious affiliation are more likely to experience depressive symptoms, suicidal ideation, respiratory diseases, and metastases. Notably, alcohol and tobacco use were lower than expected among those with low social support, and participants with high social support did not engage in binge drinking as often as expected.

In light of these findings, health care professionals need to incorporate social support assessment into routine oncology care, recognizing its profound impact on mental health and substance use behaviors. Strategies to enhance social support networks, such as referrals to support groups, psychological counseling, and community-based interventions, should be actively promoted within healthcare settings.

Furthermore, future research should delve deeper into the underlying mechanisms linking social support to health behaviors in different contexts. Investigating effective interventions to enhance social support and mitigate its negative consequences on the mental and physical well-being of cancer patients remains a critical area for further research.

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