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Cancer Literacy Among Youth University Students and Motivations for Volunteering

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Abstract: Cancer literacy is essential for promoting preventive behaviors and making informed decisions for a healthier lifestyle. There are significant gaps in the knowledge of modifiable and non-modifiable cancer risk factors among university students. The objective of this study is to evaluate the level of cancer literacy, characterize motivations for volunteering, and explore possible associations between the variables, relating them to sociodemographic data. The sample comprised 308 higher education students aged 18 or above. A sociodemographic questionnaire, the Students Knowledge and Perceptions about Cancer test, and the Volunteer Functions Inventory were administered. The findings indicated higher levels of cancer literacy among females, students involved in volunteering, and those in the Medical and Health Sciences. Women placed more importance on experience, values, and growth functions in volunteering. The correlation between cancer literacy and motivations for volunteering proved to be significant for the experience and values functions. The findings of this study are particularly pertinent to the field of education, highlighting the need for strategies aimed at the prevention of the disease and the training of young adults in cancer literacy.

Keywords: cancer literacy; cancer prevention; health promotion; motivations for volunteering; university students



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1. Introduction

Health literacy is a critical factor in maintaining and improving population health (Okan et al., 2019; Rajah et al., 2019; Skyring et al., 2023), with the potential to reveal health inequalities when access to care is limited (Pedro et al., 2016; Sharp et al., 2023). Within health literacy, cancer literacy emerges as a fundamental component, encompassing knowledge about cancer risk factors, prevention strategies, early detection methods, and treatment options (Drummond et al., 2019). Adequate cancer literacy empowers individuals to make informed decisions, promoting both prevention and early detection of the disease (Adedimeji et al., 2016; Diviani & Schulz, 2012; Fleary et al., 2018). However, research indicates that many university students have gaps in cancer-related knowledge, which may hinder their ability to adopt protective behaviors and seek timely medical advice (Sharp et al., 2023).

As emerging young adults, college students are prone to risk behaviors that may affect their future health (Dias et al., 2019), including mental health (Conley et al., 2023), sexual health, nutrition, and substance use (e.g., alcohol, tobacco and drugs), which can increase the risk of developing oncological disease (DGS, 2019; Fleary et al., 2018). On the other

hand, the university environment offers community engagement opportunities, such as volunteering (Chickering & Reisser, 1993; Ribeiro & Sani, 2009), which may serve as a platform to enhance cancer literacy and can be driven by diverse motivations, from the desire to help others to personal and professional development (Monteiro et al., 2012).

Despite growing research on health literacy, gaps remain in knowledge about the modifiable factors that should be considered when making lifestyle changes, especially among university students (Adedimeji et al., 2016; Sharp et al., 2023). Exploring the relationship between cancer literacy and motivations for volunteering is relevant, particularly in understanding how volunteering contributes to oncology-related organizations, for example. This perspective highlights the potential impact of health literacy and motivational factors on volunteer engagement and effectiveness in addressing cancer-related challenges.

1.1. Theoretical Background of This Study

The college student is described by Arnett (2024) as an emerging adult. At this stage, individuals are concerned with assuming responsibility and making autonomous decisions. The challenges associated with transition, adaptation, and permanence in higher education are in line with the characteristics of this stage, leading to an occasion for identity building (Fonseca et al., 2014; Kendler et al., 2015). New roles are imposed on students and the need arises for them to develop appropriate adaptive responses to deal with the changes. Several authors draw attention to the maturity and psychosocial development of individuals and conclude that not everyone is prepared to take on responsibilities (Chaves et al., 2010; Chickering & Reisser, 1993), which leads to greater vulnerability to emotional and psychological difficulties (Conley et al., 2018; Dias et al., 2019). Although the majority of students succeed in their careers, risk behaviors associated with exploring the social context of college may become part of their lifestyle (Soares et al., 2016). In this way, promoting health literacy during the transition to higher education is critical to the long-term well-being of students (Koutra et al., 2024), enabling them to develop a critical awareness of the risks associated with the lifestyles they adopt. Health literacy can be defined as an individual's ability to take control of their health, seek information, and make responsible decisions (Dolezel et al., 2018; Grace et al., 2019). According to the literature, lower levels of health literacy are associated with more negative health outcomes, less healthy behaviors and lifestyles, poorer health perceptions (Okan et al., 2019; Skyring et al., 2023), and less participation in preventive care, such as cancer screening (Kobayashi & Smith, 2015; Kolinsky et al., 2021). Research that has examined gender differences has found that men tend to have lower levels of health literacy (O'Shaughnessy & Laws, 2010).

Several models underpin health literacy. According to the World Health Organization (WHO, 2013) and looking at the conceptual model of the European Health Literacy Survey (Pedro et al., 2016), health literacy is divided into three domains: (1) health care, which includes all abilities to interpret information related to medical issues as well as decision making; (2) disease prevention, which includes the recognition of risk factors associated with different diseases and the ability to assess the relevance of this information; and (3) health promotion, which refers to the willingness to acquire new knowledge about health and to develop an informed opinion about it. This model also describes four indicators that emphasize the complexity of health literacy skills: (a) the ability to access information (i.e., the ability to search for and/or obtain health-related information); (b) the ability to understand information (i.e., the ability to comprehend the information found); (c) the ability to interpret and evaluate information (i.e., the individual's ability to filter, interpret, and evaluate information; and (d) the ability to use information (i.e., the application of that information in decision making with the goal of improving the individual's health). Other authors distinguish perceptions from knowledge as crucial dimensions of cancer literacy. In

contrast to knowledge, which assesses the objective level of how an individual understands aspects of cancer, perceptions include beliefs, attitudes, and subjective understandings that moderate, for example, how the severity of the disease is interpreted (Barros et al., 2018; Barros et al., 2014).

When analyzing the college context, it is important to ensure that students have information about preventing complex diseases such as cancer. Currently, although cancer mortality rates are slowly decreasing in certain parts of the world (Sharp et al., 2023), this disease is recognized as the second leading cause of death in economically developed countries (Fleary et al., 2018). Cancer literacy refers to the knowledge an individual needs to access and understand information from the health care system regarding cancer prevention, diagnosis, and specific treatment (Diviani & Schulz, 2012). Evidence from studies suggests that women, individuals with higher education and medical training, or family members of cancer patients tend to have higher levels of cancer literacy (Diviani & Schulz, 2012; von Wagner et al., 2007). Adedimeji et al. (2016) emphasize that lack of knowledge can be one of the greatest barriers to cancer prevention and early detection. In fact, cancer literacy could be improved by empowering citizens, using a combination of individual support and policy structures (Sørensen et al., 2020). In this sense, the promotion of prevention strategies should be based on health literacy. Considering that college students are often exposed to social media, it is crucial that interventions promote attitudes towards seeking more reliable oncological information, encouraging the use of safe online platforms adapted to their needs.

Studies of volunteering began in the 1950s, and since then, various explanatory models have been developed to understand the motivations of volunteers in different fields. One of the first to emerge was the Two-Factor Model (Horton-Smith, 1981), which categorized the motivations of volunteers as altruistic and egoistic, according to the interests and the direct benefits of their work. Altruistic motivations were based on philanthropy, while egoistic motivations were associated with direct benefits to the volunteer. In subsequent years, the Three-Factor Model was developed (Fitch, 1987), in which the author identified altruistic, egoistic, and social obligation motivations. Morrow-Howell and Mui (1989) emphasized altruistic, social, and material motivations. Caldwell and Andereck (1994) mentioned intentional, material, and solidarity motivations. In the 1990s, these models began to be criticized for being overly descriptive, not adequately analyzing correlations between motivational factors, and using limited samples. This led to the development of a new paradigm, the Multifactor Model (Clary et al., 1998). This model, based on functionalist theory, suggests that different people may engage in the same volunteer activity with different motivations that fulfill different psychological functions. The work of Clary et al. (1998) eventually gained great prominence and led to the Volunteer Functions Inventory (VFI), a scale that identified six motivational functions for volunteering. These included (1) the values function, in which volunteering is expressed through values that are important to the individual and seeks to help those most in need; (2) the experience function, in which the volunteer seeks to explore the world through their skills and make room for new learning; (3) the self-esteem function, in which the individual seeks personal satisfaction through their psychological development; (4) the career function, in which the goal is to gain experience related to a professional career; (5) the social function, in which volunteering allows social relationships to be strengthened; and (6) the protection function, in which the individual seeks volunteering as a way to solve personal problems/reduce negative feelings.

Recent academic work (Gomes, 2021) highlights that youth volunteering has a significant impact on the development of personal and social skills, contributing to civic engagement and personal growth. Volunteering has been described as a pro-social be-

havior that aims to benefit others and is part of a context of selfless help (Monteiro et al., 2012). According to Ramaekers et al. (2022), volunteering is an interaction between a helper and a beneficiary, the purpose of which is to achieve some level of well-being. The motivations for volunteering, as described by Wang et al. (2017), often include a desire to see the community grow and a belief that active participation can contribute to social development. Studies suggested that volunteering is gender-specific, with women tending to volunteer more frequently than men (Papadakis et al., 2004). The prevalence of the value function in women fits the traditional stereotype that this gender is more caring and service-oriented than men (Papadakis et al., 2004; Clary et al., 1998). Based on advances in the literature, some new research has examined the benefits of involvement in volunteer activities. In higher education, it has been concluded that it acts as a protective factor. It acts as a non-formal educational space that can stimulate self-confidence and social integration and cohesion (Serapioni et al., 2013). It has been shown to be an important process for higher education students through the practical application of acquired knowledge, decision making, and the exploration of professional interests (Arnett, 2024). Looking at the potential impact on cancer literacy, Serapioni et al. (2013) argue that volunteering provides a space for personal growth, not only promoting technical learning but also strengthening fundamental aspects such as critical thinking and information and knowledge acquisition.

1.2. Research Goals

The aim of this research is to examine (a) cancer literacy (perceptions and knowledge) and motivations for volunteering (values, experience, growth, career, social and protective functions) in a sample of Portuguese college students, as well as their association with sociodemographic variables (gender, volunteering experience, and study field); (b) the associations between cancer literacy and motivations for volunteering.

Based on the literature review and the stated objectives, the following hypotheses are outlined:

H1. *cancer literacy may vary significantly between genders, with women tending to be more educated (O'Shaughnessy & Laws, 2010).*

H2. *students with volunteer experience showing higher levels of cancer literacy (Gomes, 2021).*

H3. *students in the health and medical fields may tend to show higher levels of cancer literacy (Diviani & Schulz, 2012; von Wagner et al., 2007).*

H4. *motivations for volunteering may differ significantly between genders (Papadakis et al., 2004; Clary et al., 1998).*

H5. *cancer literacy and motivations for volunteering may show a significant correlation (Arnett, 2024; Serapioni et al., 2013).*

2. Materials and Methods

2.1. Data Collection and Participants

The study data were collected through an online survey on the LimeSurvey platform between March and May 2024. The link to the questionnaire was sent to universities and their students using a snowball sampling technique. The inclusion criteria were to be at least 18 years old and enrolled in a Portuguese university. The sample consisted of 308 college students: undergraduate (54.87%), Master's (37.34%) and PhD (6.82%). Participants were aged between 18 and 59 ($M = 23.54$; $SD = 6.63$) and the majority were female (76.62%). The majority of the students were studying Social Sciences (53.25%). Only one participant

reported being a cancer patient, and the majority (85.06%) reported having been exposed to cancer. Of all the participants, 62.66% were involved or had been involved in some type of volunteer experience (Table 1).

Table 1. Sociodemographic characterization of the university student sample ($N = 308$).

Variable	Count (%)
Gender	
Female	236 (76.62)
Male	70 (22.73)
Prefer not to say	2 (0.65)
Field of Study	
Exact Sciences	5 (1.62)
Natural Sciences	28 (9.09)
Engineering Sciences and Technologies	33 (10.71)
Medical and Health Sciences	50 (16.23)
Agricultural Sciences	8 (2.59)
Social Sciences	164 (53.25)
Humanities	20 (6.49)
Degree	
Bachelor's	169 (54.87)
Master's	115 (37.34)
PhD	21 (6.82)
Other	3 (0.97)
Oncological patient	
No	307 (99.68)
Yes	1 (0.32)
Contact with Oncological Disease	
No	46 (14.94)
Yes	262 (85.06)
Volunteering	
No	115 (37.33)
Yes	193 (62.66)

2.2. Instruments and Measures

A questionnaire was created for the sociodemographic characterization. The questions were about gender, field and region of study, contact with cancer, and involvement in volunteer work.

Students Knowledge and Perceptions about Cancer (SKPaC; [Barros et al., 2018](#)) is an instrument developed with the main objective of assessing students' perceptions and knowledge about cancer. It focuses on different topics (i.e., cervical, breast, colorectal, and skin cancer, taking into account aspects related to risk behavior and prevention) and is composed of two parts: perceptions (13 items) and knowledge (16 items). The perception section is an 11-point Likert scale (0—'I don't know anything' to 10—'I know almost everything') on the above-mentioned topics. The knowledge domain focuses on 16 multiple-choice questions with one or more correct answer (e.g., 'Getting a vaccine can prevent which of the following types of cancer', where the answer options would be 'breast cancer; cervical cancer; colorectal cancer; skin cancer; or I don't know'). To analyze knowledge, correct answers were scored 1 point and incorrect or 'I don't know' answers were scored 0 points. The score range for this domain is between 0 and 16, and the higher the score, the greater the knowledge about cancer. In the present study, both dimensions showed good internal consistency, namely perception ($\alpha = 0.92$), and knowledge ($\alpha = 0.75$).

The Portuguese version of the Volunteer Functions Inventory (VFI; [Clary et al., 1998](#); [Monteiro et al., 2012](#)) was used to assess motivations for volunteering. Responses are provided on a 7-point Likert scale (1—‘not at all important’ to 7—‘extremely important’), to a total of 30 items organized into six subscales (values, experience, growth, career, social and protective functions). Scores on the total scale range from 30 to 210, so the higher the score, the greater the importance of the specific motivation to the volunteer. The construct validity of the VFI has been supported in previous studies through Confirmatory Factor Analysis (CFA), confirming its six-factor structure ([Martins et al., 2024](#)). This reinforces the theoretical model underlying the instrument and its applicability in different contexts. In the present study, the VFI showed excellent internal consistency ($\alpha = 0.94$).

2.3. Ethical Considerations

Once sociodemographic data had been collected, the study was presented to and approved by the Ethics Committee of the University of Évora (document GD/49201/2023, approved at 12 April 2024) before the online survey was administered. The survey began with detailed information about the objectives of the study, data collection, and consent. Participants were informed that participation was entirely voluntary and anonymous.

2.4. Analysis

Statistical analysis was performed using IBM SPSS© version 29. The normality of the variables to be compared was analyzed using the Kolmogorov–Smirnov test, and the homogeneity of variances was checked using the Levene test. The results indicated that the data did not follow a normal distribution. However, we chose to use parametric tests as they seem to be robust even with moderate violations of normality ([Field, 2009](#)). Descriptive statistics (i.e., frequencies, percentages, means, and standard deviations) and inferential statistics (i.e., Student’s *t*-test for independent samples, ANOVA, Games–Howell’s multiple comparisons test, and Pearson correlations) were calculated.

3. Results

3.1. Descriptive Statistics

Means and standard deviations for cancer literacy and motivation for volunteering, as well as sociodemographic characteristics of the sample, are presented below to facilitate understanding of the data.

3.2. Cancer Literacy

3.2.1. Students’ Perceptions of Cancer

When gender was taken into account (Table 2), the difference between the groups was statistically significant, with women having significantly more favorable perceptions than men: $t(304) = 2.67$; $p = 0.008$; $d = 0.36$.

Regarding volunteering, the difference between the groups was statistically significant, with students who engaged or are engaging in volunteering showing perceptions significantly more favorable than students who do not practice: $t(306) = -2.13$; $p = 0.034$; $d = -0.25$.

When it came to the fields of study, ANOVA revealed a significant difference between the groups: $F(6, 301) = 4.18$; $p < 0.001$; $\eta^2 = 0.077$. Games–Howell’s multiple comparisons test showed that the field of Medical and Health Sciences had a significantly favorable level of perceptions than Engineering Sciences ($p = 0.014$) and Social Sciences ($p = 0.001$) students.

Table 2. Descriptive statistics (*M* and *SD*) of cancer literacy and motivations for volunteering dimensions by sociodemographic variables (gender, volunteering experience, and study field).

	Cancer Literacy			Motivations for Volunteering				
	Perceptions	Knowledge	Values	Experience	Growth	Career	Social	Protective
Total	4.94 (2.10)	9.16 (3.14)	5.54 (1.23)	5.65 (1.26)	4.74 (1.53)	4.33 (1.62)	3.49 (1.45)	3.38 (1.48)
Gender								
Male	4.36 (2.29)	8.50 (3.09)	4.95 (1.25)	5.07 (1.41)	4.19 (1.61)	4.07 (1.71)	3.43 (1.45)	3.09 (1.54)
Female	5.12 (2.02)	9.35 (3.13)	5.72 (1.18)	5.82 (1.16)	4.91 (1.47)	4.42 (1.59)	3.51 (1.46)	3.47 (1.45)
Volunteering Experience								
Yes	5.14 (2.04)	9.40 (3.17)	5.76 (1.11)	5.92 (1.03)	5.01 (1.42)	4.42 (1.68)	3.63 (1.51)	3.55 (1.50)
No	4.61 (2.17)	8.75 (3.05)	5.17 (1.35)	5.20 (1.46)	4.29 (1.60)	4.18 (1.50)	3.25 (1.32)	3.10 (1.39)
Field of Study								
Exact Sciences	4.15 (1.97)	8.60 (2.19)	6.00 (0.96)	6.08 (1.10)	6.36 (0.65)	4.92 (1.87)	4.32 (2.20)	4.76 (1.62)
Natural Sciences	5.26 (1.69)	10.36 (2.87)	5.85 (0.86)	5.97 (0.85)	4.72 (1.21)	4.55 (1.46)	3.52 (1.31)	3.26 (1.17)
Engineering Sciences and Technologies	4.47 (2.13)	8.42 (3.17)	5.11 (1.50)	5.12 (1.44)	4.57 (1.49)	3.76 (1.80)	3.57 (1.52)	3.42 (1.55)
Medical and Health Sciences	6.15 (2.16)	11.12 (2.88)	5.58 (1.23)	5.46 (1.20)	4.63 (1.32)	4.02 (1.40)	3.43 (1.04)	3.39 (1.30)
Agricultural Sciences	5.29 (2.28)	9.88 (3.31)	5.38 (0.98)	5.95 (1.02)	4.80 (1.53)	4.48 (1.87)	2.50 (0.65)	3.05 (0.81)
Social Sciences	4.70 (2.00)	8.53 (2.96)	5.58 (1.22)	5.80 (1.23)	4.92 (1.55)	4.58 (1.59)	3.55 (1.54)	3.45 (1.56)
Humanities	4.35 (2.24)	8.75 (3.40)	5.26 (1.39)	5.10 (1.56)	3.44 (1.74)	3.55 (1.66)	3.13 (1.62)	2.63 (1.36)

3.2.2. Students' Knowledge of Cancer

When gender was taken into account (Table 2), the difference between the groups was statistically significant, with women having a significantly higher level of knowledge than men: $t(304) = 2.01$; $p = 0.046$; $d = 0.27$.

The students who were involved in volunteering showed a marginally favorable level of knowledge than the group who did not practice volunteering: $t(306) = -1.77$; $p = 0.078$; $d = -0.21$.

Concerning the fields of study, ANOVA revealed a significant difference between the groups: $F(6, 301) = 6.02$; $p < 0.001$; $\eta^2 = 0.107$. Games–Howell's multiple comparisons test showed that the field of Medical and Health Sciences had a significantly more positive level of knowledge than Engineering Sciences ($p = 0.004$) and Social Sciences ($p < 0.001$) students.

3.3. Motivations for Volunteering

In terms of the motivational functions for volunteering, experience was the one most valued by the students, followed by the values, growth, career, social, and protective functions (Table 2). Looking at gender, the results revealed that women showed significantly more favorable levels compared to men in the values ($t(304) = 4.68$; $p < 0.001$; $d = 0.64$), experience ($t(98.36) = 4.10$; $p < 0.001$; $d = 0.62$), and growth functions ($t(304) = 3.50$; $p < 0.001$; $d = 0.48$).

When analyzing involvement in volunteering, the results revealed significant differences between the groups. Students who had already been involved or were still involved in volunteering showed a significantly more favorable level compared to students who were not in the values ($t(204.91) = -3.98$; $p < 0.001$; $d = -0.49$), experience ($t(182.59) = -4.63$; $p < 0.001$; $d = -0.59$), growth ($t(306) = -4.13$; $p < 0.001$; $d = -0.49$), social ($t(306) = -2.20$; $p = 0.029$; $d = -0.26$), and protective functions ($t(306) = -2.61$; $p = 0.009$; $d = -0.31$).

In the fields of study, Levene's test indicated a violation of the homogeneity of variance assumption for the social function ($p = 0.003$). ANOVA revealed a significant difference between the groups for the experience ($F(6, 301) = 2.74$; $p = 0.013$; $\eta^2 = 0.052$), growth, ($F(6, 301) = 4.07$; $p < 0.001$; $\eta^2 = 0.075$), and career ($F(6, 301) = 2.72$; $p = 0.014$; $\eta^2 = 0.051$) functions. Games–Howell's multiple comparisons test indicated that, for the growth function, significant differences were found between Exact Sciences and Natural Sciences ($p = 0.016$), Engineering Sciences and Technologies ($p = 0.009$), Medical and Health Sciences ($p = 0.012$), Social Sciences ($p = 0.040$) and Humanities ($p < 0.001$), and, additionally, between Social Sciences and Humanities ($p = 0.020$) students.

3.4. Association Between Cancer Literacy and Motivations for Volunteering

Concerning the association between cancer literacy and the motivational functions for volunteering among college students (Table 3), there were positive and statistically significant correlations between perceptions of cancer and the values ($p < 0.001$) and experience functions ($p < 0.001$), and between knowledge of cancer and the values ($p < 0.001$) and experience functions ($p < 0.05$). A positive correlation between perception and knowledge dimensions was also found ($r = 0.57$; $p < 0.001$).

Table 3. Correlation between cancer literacy (perceptions and knowledge) and motivations for volunteering.

	Perceptions	Knowledge
Motivations for Volunteering		
1. Values function	0.25 **	0.21 **
2. Experience function	0.16 **	0.12 *
3. Growth/self-esteem function	0.10	0.03
4. Career function	0.04	−0.08
5. Social function	0.06	−0.01
6. Protective function	0.05	−0.02

* $p < 0.05$; ** $p < 0.001$.

The results therefore suggest that greater awareness and knowledge of cancer (literacy) may be associated with volunteering motivated by the values and experience functions.

4. Discussion

This study aimed to understand cancer literacy (perceptions and knowledge) and motivations for volunteering (values, experience, growth, career, social, and protective) in a sample of Portuguese college students, as well as their relationship with sociodemographic variables (gender, volunteering experience, and field of study). It also considered the associations between cancer literacy and motivations for volunteering.

In terms of perception and knowledge about cancer, the results suggest that university students have room for improvement, consistent with existing literature, in which [Skyring et al. \(2023\)](#) argue that almost half of adults have difficulty understanding and acting on health information. However, the knowledge results are more promising than the perceptions in this context of higher education. We could suggest an interference of factors such as stigma and fear of the disease, which may not allow students to perceive cancer-related information clearly.

When looking at cancer literacy by gender, women stand out, supporting the hypothesis that cancer literacy might differ significantly between genders (H1). The results are thus in line with previous studies ([O'Shaughnessy & Laws, 2010](#); [Seaton et al., 2020](#); [von Wagner et al., 2007](#)). [Wardle et al. \(2015\)](#) also add that higher literacy among women is associated with greater participation in prevention activities (such as population screening) and greater awareness of the disease.

The existence of a significant difference in cancer literacy between students who volunteer and those who do not was partially confirmed (H2), as only the perceptions domain was higher in the students with experience in volunteering. Some authors emphasize the benefits of volunteering during their time in higher education, namely the learning acquired in terms of self-confidence and critical thinking, which enriches students and makes them more proactive in the community ([Handy et al., 2010](#)). On the other hand, the differences that were not found in terms of knowledge may be due to the type of activities that students engage in and whether or not formal health education is involved, which may not promote the development of cancer literacy concerning scientific information.

When considering the students' field of study, both the perception and knowledge domains highlighted that Medical and Health Science students had significantly higher levels of cancer literacy (H3). The findings support the study conducted by [Diviani and Schulz \(2012\)](#), who found that individuals with medical qualifications had significantly more favorable levels of cancer literacy. In fact, health students are more exposed to oncology-related content, and this difference is particularly pronounced when compared to Engineering and Technology, Social Sciences, and Humanities students.

Regarding the motivations for volunteering, the results were consistent with several studies ([Dávila & Díaz-Morales, 2009](#); [Finkelstein et al., 2005](#); [Monteiro et al., 2012](#)) that show that motivations related to new learning, skills, and more altruistic feelings are more likely to underlie volunteering. When gender differences were considered, the hypothesis was fully supported (H4). In fact, there was a statistically significant difference between the genders, with women identifying more with the values, experience, and growth functions, as mentioned by [Papadakis et al. \(2004\)](#). However, no differences were found for the social, protective, and career functions. This may be due to the gender representation in the sample (n), where men outnumbered women.

The present study explores the association between cancer literacy and motivations to volunteer (H5); the results indicated a correlation between perception and knowledge and the values and experience functions. There are no known studies that have examined the relation between the variables, but the association is highlighted as part of a process in which the information acquired about cancer triggers deeper and more altruistic motivations in students to help others or to grow personally. Students who have greater knowledge about the disease, whether through formal education, awareness campaigns, or personal experience, not only recognize its seriousness and the need for prevention but also feel motivated to act in favor of collective well-being. In this sense, according to the results and as advocated by [Adedimeji et al. \(2016\)](#), awareness and education campaigns on cancer can increase the population's knowledge about the disease and, in addition, encourage voluntary action, highlighting the need for interventions that can attract and retain volunteers.

5. Conclusions

A review of the present research reveals a concerted effort to explore the associations between cancer literacy and motivations for volunteering among university students, as well as their relation with sociodemographic characteristics. We realized the need to study the variables beyond their isolated context in order to explore results that could be translated into implications for clinical and health care practice as well as indicate limitations of this study and implications for future research.

5.1. Practical Implications

When considering health education, we must consider that the development of awareness programs that promote proximity to the subject of cancer can not only promote knowledge and proactivity in relation to cancer prevention but also encourage volunteerism for causes such as health.

Promoting cancer literacy can be a focus in various disciplines beyond the health sciences, developing both knowledge and social responsibility in students. It is up to higher education institutions to implement workshops and multidisciplinary projects focusing on health, volunteering, and citizenship. In addition, it becomes possible to tailor campaigns to specific audiences by looking at the possible motivational functions of certain populations to help (e.g., campaigns focused on volunteering in the health sector can highlight the personal and social benefits). Academies can also see from this study the benefits of developing

internal cancer awareness campaigns. Engaging students who are better educated in a specific awareness-raising initiative could lead to increased participation in screening and the adoption of healthier lifestyles.

In terms of public health policy, this study could influence the design of policies aimed at promoting volunteerism by demonstrating that increasing cancer literacy is an effective way to mobilize society. It is therefore important to focus on different target groups such as adolescents, young adults, and the elderly.

One of the concerns of clinical and health psychology may indeed fall on volunteering, due to the need for individual counseling on issues related to the emotional challenges that volunteers may face, among others. Volunteers' search for well-being and motivation will influence the direction of their behavior, allowing them to develop emotionally and cognitively throughout their journey and, in turn, be in harmony with their progress, with them tending to remain identified with the organization. From this point of view, this study highlights the importance of personalizing volunteer programs by adapting activities to the main motivations of volunteers. It also makes it possible to adjust recruitment strategies, which can be more effective when considering the relation between greater cancer literacy and motivations related to values and experiences. From this perspective, nongovernmental cancer and health organizations could benefit from assigning individuals with greater cancer knowledge to roles that allow them to apply this knowledge, as well as recognizing that volunteers motivated by different roles may need different incentives throughout their involvement.

5.2. Limitations and Future Research

The study has some common limitations in psychology research (especially in exploratory studies), such as the use of a cross-sectional design, which limits the inference of causal relationships between variables, but is often used for exploratory research providing an initial picture of the relationship between variables; the non-probabilistic sampling method, which may lead to bias sample composition, but allows quick and simple access to a number of university students that wish to participate in exploratory research; and self-report instruments, which allow for socially desirable responses but are a privileged way of collecting data about individuals' private experiences (e.g., motivations). Despite these limitations, the present study provides an opportunity and basis for future research.

First, research could be conducted longitudinally to observe the direction of causality of the variables. It might also be valuable to analyze and compare the influence of educational or even intervention programs on cancer literacy. In order to obtain a macroscopic view of the state of cancer literacy in higher education and the practice of volunteering, it would be interesting to replicate this study with a more robust national sample that could count on the support of academic institutions. In addition, it would be beneficial for future studies to extend the research to other populations (e.g., older adults and the elderly, cancer survivors) and to consider contextual aspects such as the stigma associated with oncological disease or the availability and formality of the volunteer work performed.

Concerning all available scientific evidence on the variables studied, this research aimed to contribute by exploring and explaining the theoretical models already established in the literature. In this way, we hope to have opened a door to the possibility of highlighting the importance of the issue of cancer literacy, cancer itself, volunteering, and the strategies that can emerge from the attention given to this context and association. Indeed, it is essential to continue to study how health literacy can influence involvement in social causes and contribute to the improvement of public health.

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