Emotions, Quality of Life and Games in Oncology Outpatient Clinic

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ABSTRACT

A cancer diagnoses and treatment can trigger unpleasant emotions, which may affect the Quality of Life (QoL). Games are known to promote wellness. The aim of this study was to evaluate emotions and QoL of adult cancer patients in medical care waiting rooms and to identify changes in patient emotions after playing board games. A total of 150 patients were included. Emotions were assessed using emojis and QoL with WHOOL-BREF. The mean age was 64.8 ± 9.6 years. QoL was measured as 'good' just in the social domain (score 72.38 ± 13.24). The most frequently reported emotion before playing was joy (58.0%), followed by neutral (21.3%), sadness (8.7%) and fear (6.7%); 34.0% of the patients accepted to play a board game. Emotions of neutrality and sadness in these patients significantly changed to joy after playing the game ($p < 0.05$). We conclude that participation in games might positively change emotions in waiting rooms.

Keywords: Quality of Life, Cancer, Emotions, Emoji, Games.

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I. INTRODUCTION

A cancer diagnosis is a stressful experience that may worsen patient emotions, due to treatments and changes in daily routines [1]-[5], besides that psychosocial factors such as fear and anxiety can influence the perception of cancer risk [6]. Such changes may include hospital visits and time spent in hospital waiting rooms, which can induce emotions that are not positive. A negative emotional state is a natural response that results from the inability to predict, control, and overcome a threatening situation [7]. Thus, this difficult period can produce negative thoughts and reactions. Sadness and fear/anxiety are emotions commonly reported by those patients [8] and may be the most felt emotions in a cancer waiting room [9]. In particular, the negative emotions of fear and sadness may interfere with the course of treatment [10] by affecting immunity or resulting in pain syndromes and somatization [11].

Emotional control during cancer treatment is linked to the process of coping with the disease and includes knowing, exploring, and understanding the emotional experience [12] and the nature of the treatment and its consequences [13].

Positive emotions are crucial for adherence to and the success of the treatment regimen and may help with the process of coping with the disease. In the course of emotional regulation, patients with cancer may avoid meeting with other people, decline social invitations [14], or attempt to avoid social activities, all of which may translate to a decrease in their quality of life (QoL) [15].

One method for building social interaction, psychological wellness is to play games as it put people together do make different choices, looking for pleasure [16].

Engaging adult cancer patients in games has played a key role in the coping process, helped them to manage internal conflicts triggered by the disease and it may minimize the pain and suffering experienced of patients during treatment [17].

In addition, these activities such as playing with clowns, and games have been reported to improve the expression of feelings, increase interactions with health teams [18], deal with situations of distress and discomfort and allow for the sensations of relaxation and fun. To take part in games may allow patients to increase their ability to understand and to deal with situations related to diseases, thereby increasing his well-being [19]. However, studies involving games for adult cancer patients remain scarce.

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Basic human feelings such as joy, sadness, anger, fear, surprise, disgust, and neutrality can be recognized in universal facial expressions. Previous studies have validated the assessment of emotions 'in the moment' by encouraging individuals to verbally express them and correlating these with photographs of facial expressions that are characteristic of the emotion [20]. Moreover, these emotions have been observed in people from different countries and customs and are considered universal [21]-[23]. Caricatures of these facial expressions have been created to be used in the electronic communication, the emoticon (sequences of punctuation marks representing facial expressions) and, with the advent of social networks, they have gained the form of emojis (the pictorial representation of the emoticon) which has solidified the relationship between the icon representing the emotion and the emotion itself [24]. This has enabled the expression of emotions in an easy and enjoyable way, eliminating possible difficulties related to the verbal expression of feelings, as well as facilitating the communication of intentions among individuals [25]. Thus, these emojis may aid in the recognition of emotions experienced by patients in hospital waiting rooms.

The aim of this study was to evaluate the QoL scores and emotions of adult cancer patients in medical care waiting rooms and to identify changes in patient emotions after playing board games in this environment.

II. MATERIALS AND METHODS

A. Study Design and Sample

This was a clinical intervention study that included cancer patients willing to partake in board games [26]. The study took place in two hospitals in the city of Piracicaba, Brazil. The hospitals belong to the Regional Network of Health Care and account for 81% of all hospital care provided in the region [27]. The minimum sample size was estimated using 122 patients based on the following parameters: the estimated number of new adult cancer cases in Piracicaba in 2018 ($N = 3788$), the prevalence of cancer ($p = 0.944759$), a confidence level of 95%, and a maximum sampling error of 4%. The sample size was increased by approximately 20% due to the potential for sample reduction if volunteers withdrew their consent for participation. A total sample size of 150 participants was calculated. The study inclusion criteria consisted of patients with a clinical history of cancer, those 40 years of age or older [28], and those who agreed to sign the written, informed consent form.

Each participant was approached at the oncology outpatient clinics of the included hospitals while he (she) was waiting to be attended. The approach began with a question to confirm if the patient had come to receive cancer treatment. If the answer was affirmative the researcher showed him (her) a card with the emoji of Joy, Sadness, Fear, Anger, Surprise, Disgust and Neutrality, asking: "How are you feeling now?" The patient pointed the emoji that represented his (her) feeling and the study was explained to him (her). If the patient accepted to take part in the study by giving his (her) writing agreement, the emotion reported was record. Then the researcher asked him questions from a clinical profile and from a questionnaire about QoL. The

patient was then invited to participate in a board game, and he (she) could choose among checkers, memory game, tic-tac-toe, chess, or dominos. If he (she) did not accept the invitation, the interview was finished. If the patient agreed, the researcher played one of the games with the patient, after which he (she) was again introduced to the card with the seven emojis and asked the question: "How are you feeling now?"

B. Measures

QoL was assessed using the WHOQOL-Bref (World Health Organization Quality of Life, short version) which has been validated for the Portuguese language [29] and contains 26 questions encompassing four distinct domains: physical, psychological, social, and environmental, along with a general QoL assessment [30]. The score achieved with this instrument used the Australian syntax [31]. This instrument is considered an adequate tool for evaluating QoL in cancer patients [32] and allows for the comparison of these patients with other QoL studies [33]-[35]. Emotions were identified in a card with emojis that represent the basic and universal emotions and that have been used among cancer patients to communicate their feelings [36]. Each emoji was subtitle with the correspondent emotion (Fig. 1). A questionnaire was used to obtain the clinical profiles of the patients.

Fig. 1. Emojis (representation of basic emotions).

C. Ethical Consideration

This study was conducted in accordance with the tenets of the Helsinki Declaration [37] and received ethical approval from the sponsoring University with protocol number 2.245.786. All participants were informed of the aims and procedures of the study and signed the free and informed consent form.

D. Data analyses

The internal consistency of the 26 items that compose the WHOQOL-Bref instrument were confirmed using the Cronbach Alpha reliability test [38]. A descriptive analysis of the variables included in the study was performed. Quantitative variables are expressed as means and standard deviations. Qualitative variables are shown as absolute values and percentages, and the results are presented in contingency tables. To evaluate the influence of games on the emotions a chi-square test was performed. A comparison of the association between the QoL scores and willingness to play a game was analyzed by the non-parametric Mann-Whitney U test. All tests were two-tailed, and the criterion for statistical significance was $p < 0.05$. Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS ver. 20) software (IBM Corp., Armonk, NY,

United States).

III. RESULTS

A total of 150 patients participated in the study. Females comprised 64.0% of the sample and the mean age was 63.50 ± 10.49 years (range: 40.0 to 86.7 years). Breast (40.7%) and prostate cancer (23.3%) were the most frequent cancer types. A more detailed description of patient clinical profiles is provided in Table I.

The reliability of the QoL data assessed using the Cronbach Alpha test was good, with $\alpha = 0.857$ (for all items). Overall, the QoL level was 'low'. The social domain was only one to reach a score of 'good' (72.38 ± 13.24), Table II.

The emotions most frequently expressed by patients before answering the questionnaires were joy (58.0%), neutral (21.3%) and sadness (8.7%). Board game activities were accepted by 34% ($n=51$) of the patients. There was no significant association between QoL scores and participation in the games ($p = 0.68$) in any one of QoL domains, Table III. There was no statistically significant association between QoL scores and patient clinical profiles, Table IV.

Chi-square tests between each emotion before and after game, showed that emotions of neutrality and sadness changed significantly after playing board games with $p=0.003$ ($p<0.05$), after playing board games 60.0% reports of sadness, 66.5% of neutrality and 55.0% of fear changed into joy; reports of joy increased 33.0%. The Table V shows the distribution of each emotion before and after the game.

TABLE I: CLINICAL PROFILE OF THE STUDY PARTICIPANTS

Variable	Categories	N	%
Age	40-59	48	32.0
	≥ 60	102	68.0
Sex	Female	96	64.0
	Male	54	36.0
Cancer Type	Breast	61	40.7
	Prostate	35	23.3
	Gastrointestinal	17	11.3
	Head and Neck	6	4.0
	Blood	5	3.3
Phase	Other	26	17.3
	In-Treatment	49	32.7
	Post-Treatment	101	67.3
Treatment	Chemotherapy	25	16.7
	Radiotherapy	13	8.7
Surgery	Other	11	7.3
	Yes	117	78.0
Emotions	No	33	22.0
	Joy	87	58.0
	Sadness	13	8.7
	Fear	10	6.7
	Anger	1	0.7
	Surprise	5	3.3
	Disgust	2	1.3
	Neutrality	32	21.3

TABLE II: AVERAGE QUALITY OF LIFE DOMAIN SCORES OF THE STUDY PARTICIPANTS

Domains	Minimum	Maximum	Mean $\pm$ SD
Physical	21.43	92.86	59.07 ± 11.25
Psychological	12.50	83.33	61.74 ± 13.74
Environmental	25.00	93.75	64.29 ± 13.28
Social	25.00	100.00	72.38 ± 13.24

TABLE III: QUALITY OF LIFE DOMAINS AND WILLINGNESS TO PLAY BOARD GAMES

Domains	Players	No players	U
PhyD	59.80 ± 12.69	58.69 ± 10.48	-0.73
PsyD	62.33 ± 14.26	61.44 ± 13.53	-0.66
SD	73.85 ± 13.43	71.63 ± 13.14	-1.38
ED	65.68 ± 13.51	63.57 ± 13.18	-1.25

Legend. U= Mann-Whitney test; QoL= Quality of Life; Domains: PhyD= Physical; PsyD= Psychological; SD= Social; ED= Environment; Values represent in (mean $\pm$ SD).

TABLE IV: QUALITY OF LIFE SCORES AND PATIENT CLINICAL PROFILES

Variables	Categories	n (%)							
		QoL Physical		QoL Psychological		QoL Social		QoL Environmental	
		Poor	Adequate	Poor	Adequate	Poor	Adequate	Poor	Adequate
Age	40 – 59	46 (30.7)	2 (1.3)	29 (19.3)	19 (12.7)	16 (10.7)	32 (21.3)	36 (24.0)	12 (8.0)
	≥ 60	85 (56.7)	17 (11.3)	68 (45.3)	34 (22.7)	44 (29.3)	58 (38.7)	67 (44.7)	35 (23.3)
Sex	Female	85 (56.7)	11 (7.3)	66 (44.0)	30 (20.0)	40 (26.7)	56 (37.3)	67 (44.7)	29 (19.3)
	Male	46 (30.7)	8 (5.3)	31 (20.7)	23 (15.3)	20 (13.3)	34 (22.7)	36 (24.0)	18 (12.0)
Cancer	Breast	51 (34.0)	10 (6.7)	41 (27.3)	30 (13.3)	24 (16.0)	37 (24.7)	42 (28.0)	19 (12.7)
	Prostate	31 (20.7)	4 (2.7)	22 (14.7)	13 (6.7)	14 (9.3)	21 (14.0)	24 (16.0)	11 (7.3)
	Gastrointestinal	15 (10.0)	2 (1.3)	12 (8.0)	5 (3.3)	8 (5.3)	9 (6.0)	14 (9.3)	3 (2.0)
	Head and Neck	6 (4.0)	0 (0.0)	3 (2.0)	3 (2.0)	3 (2.0)	3 (2.0)	3 (2.0)	3 (2.0)
	Blood	5 (3.3)	0 (0.0)	3 (2.0)	2 (1.3)	1 (0.7)	4 (2.7)	4 (2.7)	1 (0.7)
Phase	Other	23 (15.3)	3 (2.0)	16 (10.7)	10 (6.7)	10 (6.7)	16 (10.7)	16 (10.7)	10 (6.7)
	In-Treatment	44 (29.3)	5 (3.3)	37 (24.7)	12 (8.0)	22 (14.7)	27 (18.0)	34 (22.7)	15 (10.0)
Treatment	Post-Treatment	87 (58.0)	14 (9.3)	60 (40.0)	41 (27.3)	38 (25.3)	63 (42.0)	69 (46.0)	32 (21.3)
	Chemotherapy	22 (44.9)	3 (6.1)	14 (28.6)	11 (22.4)	6 (12.2)	19 (38.8)	18 (36.7)	7 (14.3)
Surgery	Radiotherapy	12 (24.5)	1 (2.0)	7 (14.3)	6 (12.2)	7 (14.3)	6 (12.2)	11 (22.4)	2 (4.1)
	Other	9 (18.4)	2 (4.1)	9 (18.4)	2 (4.1)	6 (12.2)	5 (10.2)	9 (18.4)	2 (4.1)
Emotions	Yes	99 (66.0)	18 (12.0)	76 (50.7)	41 (27.3)	50 (33.3)	67 (44.7)	78 (52.0)	39 (26.0)
	No	32 (21.3)	1 (0.7)	21 (14.0)	12 (8.0)	10 (6.7)	23 (15.3)	25 (16.7)	8 (5.3)
Emotions	Joy	73 (48.7)	14 (9.3)	48 (32.0)	39 (26.0)	34 (22.7)	53 (35.3)	54 (36.0)	33 (22.0)
	Sadness	12 (8.0)	1 (0.7)	9 (6.0)	4 (2.7)	4 (2.7)	9 (6.0)	10 (6.7)	3 (2.0)
	Fear	10 (6.7)	0 (0.0)	10 (6.7)	0 (0.0)	4 (2.7)	6 (4.0)	10 (6.7)	0 (0.0)
	Anger	1 (0.7)	0 (0.0)	1 (0.7)	0 (0.0)	1 (0.7)	0 (0.0)	1 (0.7)	0 (0.0)
	Surprise	4 (2.7)	1 (0.7)	3 (2.0)	2 (1.3)	2 (1.3)	3 (2.0)	3 (2.0)	2 (1.3)
	Disgust	2 (1.3)	0 (0.0)	2 (1.3)	0 (0.0)	0 (0.0)	2 (1.3)	2 (1.3)	0 (0.0)
	Neutral	29 (19.3)	3 (2.0)	24 (16.0)	8 (5.3)	15 (10.0)	17 (11.3)	23 (15.3)	9 (6.0)

TABLE V: EMOTIONS BEFORE AND AFTER TAKING PART IN A GAME

		Emotions after playing games					Total
		Joy	Sadness	Fear	Surprise	Neutral	
Emotions before playing games	Joy	Count 32 _a 97.0%	0 _a 0.0%	0 _a 0.0%	1 _a 3.0%	0 _a 0.0%	33 100.0%
	Sadness	Count 3 _a 60.0%	1 _b 20.0%	0 _{a, b} 0.0%	1 _{a, b} 20.0%	0 _{a, b} 0.0%	5 100.0%
	Fear	Count 1 _a 50.0%	0 _{a, b} 0.0%	1 _b 50.0%	0 _{a, b} 0.0%	0 _{a, b} 0.0%	2 100.0%
	Surprise	Count 1 _a 100.0%	0 _a 0.0%	0 _a 0.0%	0 _a 0.0%	0 _a 0.0%	1 100.0%
	Disgust	Count 1 _a 100.0%	0 _a 0.0%	0 _a 0.0%	0 _a 0.0%	0 _a 0.0%	1 100.0%
	Neutral	Count 6 _a 66.7%	0 _{a, b} 0.0%	0 _{a, b} 0.0%	1 _{a, b} 11.1%	2 _b 22.2%	9 100.0%
	Total	Count 44 86.3%	1 2.0%	1 2.0%	3 5.9%	2 3.9%	51 100.0%

Letters "a" and "b" show the results of comparing the proportions of each line (category); different letters together indicate significant differences within the analyzed category.

IV. DISCUSSION

The present study is one of the first to evaluate QoL and the emotions of adult cancer patients before and after playing board games in the waiting rooms of outpatient clinics. QoL measurement tools involve a number of domains such as physical, social, sexual, spiritual, cognitive and psychological [39]. In the present study, the patients showed high QoL scores only in relation to the social domain, with a mean score of 72.38 ± 13.24 . The lowest mean score was in the physical domain at 59.07 ± 11.25 points. These findings are in agreement with previous studies [33], [40] investigating patients diagnosed with breast cancer that also found higher scores in the social domain and lower scores in the physical one. Social support, primarily consisting of care from family and friends during the disease and treatment process, can play a fundamental role in the lives of patients. Rukshani et al. [41] reported that patients who felt alone had low QoL scores, while those who stated they had strong family support had higher scores.

The physical domain of the QoL is composed of 7 facets that include issues related to pain, medical treatment, physical appearance, sleep, and satisfaction with physical ability. Although we found no significant associations between the phases or types of treatments and patient QoL scores, the often-invasive treatments that patients undergo can result in transient, undesirable side effects such as headaches, fatigue, and weakness [42]. These symptoms may then significantly affect their QoL scores [43], which may be one of the reasons why patients presented low scores in this domain. Patients with more comorbidities also typically have low QoL scores in the physical domain [44].

Individual perceptions, concerns and expectations, along with diseases that affect the lives of patients, can directly affect QoL scores [45], [46]. However, even in stressful environments such as the waiting rooms of outpatient clinics, more than half of the patients in this study indicated experiencing positive emotions. This may be related to feelings of being cared for in these environments; and, leading to feeling more secure in their treatment. This is important, as positive emotions may act as mediators when patients encounter negative and stressful situations [47]. Consequently, patients may generate new, positive emotions. This cycle can contribute to the well-being of the individual and generate an increase in positive emotions

during future experiences [48]. Although many of the patients in the present study reported a positive emotional state (joy), we also found, to a lesser degree, states of neutrality (21.3%) sadness (8.7%), and fear (6.7%). These findings differ from those of Resega et al. [10], in which cancer patients who waited for procedures in waiting rooms exhibited more sadness and fear. No significant associations were found between the QoL from different domains and the emotions the patients reported, but evidence has shown that emotional problems may be related to poor QoL scores in patients with Lung cancer [49].

In this study, the strategy of implementing activities in the waiting room was achieved through playfulness, specifically through use of various board games, which were played by 51 patients (34%). There was association between the treatment phase and the acceptance to play game ($X^2 p=0.038$ for $p < 0.05$) and the adherence to play games was greater among the patients who were in the post-treatment phase.

No significant associations were found between the QoL domains and the type of game played, and the QoL scores did not affect the probability of engaging in a game. Hence, games may be played regardless of the patients' QoL levels. This may be due to the fact that these patients exhibit minor side effects at the end of treatment, resulting in a greater willingness to engage in different activities. However, games were also accepted by patients during the treatment phase (7.3%), demonstrating that game acceptance included patients with varying clinical profiles.

Resega et al. [10] reported that approximately 35% of clinical patients showed an interest in activities that contributed to their distraction while waiting for procedures. This percentage is very similar to the rate of game acceptance in the present study. While some patients showed more interest in engaging in different activities in these environments, more studies are necessary to better understand the reasons why a patient accepts an invitation to engage in game play.

The creation of different experiences in hospital waiting rooms by means of recreational activities may contribute to a significant decrease in patient anxiety, as well as allow patients to better confront their circumstances and change how they perceive their time spent in hospital settings [50]. In addition, the implementation of activities that promote patient enjoyment during the time spent in waiting rooms

has been seen by the patients themselves as a way to minimize the emotional suffering experienced in these settings [51].

In this study, the majority of patients (64.7%) who played games indicated their initial emotion as joy. This may indicate that patients with positive affective states are more likely to engage in diverse activities that contribute to their abilities to cope with adverse situations. Although scarce, there is some evidence suggesting that patients who play games in waiting rooms experience positive emotions in regard to their general well-being [52]. Affective states can be contextualized as a term that encompasses responses to stress, mood, and emotions, where the regulation of these components also involves adopting coping strategies under certain circumstances [53]. As emotions are considered acute affective states triggered by specific stimuli and contexts [14], we observed that games acted as a stimulus capable of generating positive emotions in specific contexts, inclusive of outpatient-clinic waiting rooms.

There is growing evidence of the benefits of playful activities, including improvements in coping mechanisms, emotional states, well-being [18], managing internal conflicts [17], the expression of feelings other than the lessening of negative thoughts [19], and an increase in positive emotions that occur in waiting rooms [54].

Games are characterized as an activity that is spontaneous and without material interest [55]. Playful activities in children under medical treatment allow for the externalization of possible conflicts such as fear, uncertainty and anguish, and are known to improve well-being [56], [57]. These same outcomes may also occur with emotionally stressed, adult cancer patients. The challenge is to transform outpatient settings into spaces that naturally allow for the expression of the feelings and desires of these patients. Furthermore, game playing may contribute to an increase in the interactions between adult patients, their families and the outpatient clinic staff, as occurs with pediatric cancer patients and their families [58].

V. LIMITATIONS

We offered only one opportunity for patients to play games with the researcher. More opportunities to engage in play may produce additional results that lead to a better understanding of playful activities in these environments.

VI. CONCLUSIONS

Adult cancer patients showed low QoL scores in the physical, psychological, and environmental domains, with high scores occurring only in the social domain, demonstrating how affected the overall QoL of cancer patients can be.

Joy was the feeling most commonly expressed by participants at the outpatient clinics, although fear, sadness, and anger were also reported. Thus, it is observed that different emotions can be manifested in outpatient waiting rooms, nevertheless, the reasons for such are not yet clear.

However, patients with negative emotions who participated in the games demonstrated a change towards positive emotions, indicating the beneficial role that games can have in the short term in hospital environments such as the waiting room.

We did detect a tendency for games to be accepted by patients, especially those with positive-affective states. It is noted that there is possibly a tendency for patients with positive emotional states to present greater engagement in relation to the activities implemented in hospitals. Patients in the post-treatment phase exhibited a greater willingness to accept game play.

The present work provides data about QoL and the basic emotions manifested by cancer patients, as well as about the role of games in the health context.

The study showed that adult patients with cancer history may benefit from games while waiting for an appointment, contributing to the minimization of negative emotions.

Further studies are needed to understand why patients experience particular emotions in medical care waiting rooms and to assess the collective role of games in hospital settings.

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