Migration Letters

Volume: 19, No: S2 (2022), pp. 1152-1162

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)

www.migrationletters.com

Mucositis Associated With Chemotherapy: Patients' Needs Assessment

Tarek Ahmed Yahya Alzahrani[1], Ibrahim Masoud Alharthi[2], Norah Jaber Alasmari[3], Hind Mohammed Hmod Albashiri[4], Aminah Saleem Al Saleem[5], Saad Abdullah Said Algharami Alghamdi[6], Hayat Abdu Fegihi[7], Meshal lafi Alotaibi[8], Hamoud Awadh A Almutairi[9], Mohsen Dukhail Alotaibi[10], Hammad Mutlaq Hammad ALqahtani[11], Roaa Nabeel Bin saddegg[12], Mada Thabet Thwebet Alsulami[13], Mona Rabea Gashoom[14]

Abstract

Background: *One of the main side effects of chemotherapy is oral mucositis, which can lead to unbearable discomfort, an intolerance to food, infection, and poor quality of life. Patients with oral mucositis may also need to take fewer chemotherapy drugs, which will lower their chances of surviving cancer. As a result, needs assessment makes it possible to avert issues or, at the very least, reduce them through suitable early action.* ***Aim:*** *This study aimed to assess needs for patients having chemotherapy induced oral mucositis.* ***Design:*** *A descriptive study design was utilized[1] to achieve the aim of this study.* ***Setting:*** *The study was conducted in the inpatients' department at Radiotherapy and Nuclear Medicine Department, affiliated to Makkah hospital.* ***Subject:*** *A purposive sample of 70 adult patients.* ***Tools of data collection:*** *1) A structured interview questionnaire 2) Oral assessment guide.* ***Results:*** *The results of this study showed that the studied patients had Physical, Psychological, Social, Spiritual and educational needs (32.9, 64.3, 31.4, 21.4& 54.3 percentages respectively), and nearly one third of studied patients had oral mucositis after chemotherapy administration.* ***Conclusion:*** *The current study concluded that most ofthe studied patients had Physical, Psychological, Social, Spiritual, educational needs.* ***Recommendations:*** *According to the needs of the patient, the current study suggested formulating guidelines for a protocol aimed at decreasing oral mucositis caused by chemotherapy.*

Keywords: *Assessment, Chemotherapy, Oral mucositis, Patients' need.*

[1]Nursing Speciality, Health surveillance centers at Jeddah Islamic port, Saudi Arabia.
[2]Nursing technician, King Faisal Medical Complex in Taif, Saudi Arabia.
[3]Nursing, Department of Public Health, Saudi Arabia.
[4]Nurse tech, Mojor Primary Healthcare Center, Saudi Arabia.
[5]Midwife, Maternity and Children's Hospital in Dammam, Saudi Arabia.
[6]Nursing technician, Prince Mishari bin Prince Mishari bin Saud Hospital in Al-Baha, Saudi Arabia.
[7]Nursing technician, phc-almangarah, Saudi Arabia.
[8]Nursing technician, Al Yamama Hospital, Saudi Arabia.
[9]Nurse Technician - Health Care Center in Umm Talih, Al-Quwayiyah Sector, Saudi Arabia.
[10]Nursing technician,Compliance assist administration , compliance third west office , aldwadmi , Saudi Arabia.
[11]Nursing,AL RAYN GENERAL HOSPITAL, Saudi Arabia.
[12]Midwife, Al hindawah primary health care, Saudi Arabia.
[13]Midwifery, East Jeddah Hospital, Saudi Arabia.
[14]Nurse, Safwa Hospital, Hazm Umm Al-Sahek Center, Saudi Arabia.

Introduction:

Although overall survival rates and progression-free survival with chemotherapy have been steadily rising, there are still a number of side effects that negatively impact quality of life. One of the most frequent and annoying side effects of chemotherapy is oral mucositis (OM), which is characterized by erythema and edema of the oral and oropharyngeal mucosa, leading to ulcerative erosive lesions 3-5 days or 7-10 days after the start of chemotherapy. (CT). **(Sahni et al., 2020)**.

The non-keratinized mucosa of the soft palate, ventral tongue/floor of mouth, and buccal and labial mucosa may be impacted by chemotherapy-induced OM. 20–40% of chemotherapy patients and 76% of individuals taking high-dose chemotherapy prior to hematopoietic stem cell transplantation (HSCT) experience this excruciating mouth lesion. Severe OM occurs in more than 90% of patients receiving treatment for oropharyngeal and mouth cancer. **(O'Neill et al., 2020).**

The functional abilities of the patient may be severely impaired by this injury, which can be extremely unpleasant. For instance, patients could struggle to communicate verbally and to consume enough food, which could result in malnutrition and dehydration as well as a sharp decline in their quality of life. This side effect may also discourage patients from sticking to their chemotherapy schedule, which could result in incomplete or delayed treatment and lower the likelihood that the cancer will be cured. **(Chan et al.,2020)**

Needs assessment is designed to identify how well and how much their needs have been satisfied or not. This assessment leads to the development of a care plan. Case presentation at the multidisciplinary team meeting leading torecommendations tailored to patient need and referral to supportive care services, needs are defined as "the requirement of some action or resource in care that is necessary, desirable, or useful to attain optimal well-being" **(Wolyniec et al., 2020).**

Need assessment completed by a nurse looking at physical, psychological, social and spiritual domains and provides direct index of what patients perceive they need help with and also measures the perceived efficacy of a health services by its users **(Scott & Jewell., 2020)**.

Significance of the study:

Chemotherapy side effects might include depressive, useless, and dependent feelings as well as changes in social or familial roles and motivational levels. Patients who notice changes in their physical appearance and self-perception may worry about their attractiveness and have social rejection anxiety. Patients may become more anxious and distressed throughout treatment if they are not given the proper tools to manage side effects, such as oral assessments. As patients begin their treatment, their needs are evaluated, and the proper amount of supportive care is given.

Aim of the study:

This study aimed to assess needs for patients having chemotherapy induced oral mucositis.

Subjects and methods:

A- Research design:

A descriptive exploratory research design was conducted to achieve the aim of this study.

B- Setting:

The study was conducted in theinpatients' department at Radiotherapy and Nuclear Medicine Department, affiliated to Makkah Hospitals, Saudi Arabia.

C- Subject:

A purposive sample of 70 adult patients (male and female) from the above mentioned setting with different ages undergoingchemotherapy. With type I error with significantlevel alpha (□) = 0.05 (confidence level 95%).

Inclusion criteria:

The study subject was selected accordingto the following criteria:

- Conscious adult patient receivingchemotherapy.
- Patients with the same type of chemotherapyprotocol.
- Patients willing to participate in the study.

D-Tools of data collection

Tool (I): A structured interviewquestionnaire:

This tool was developed by the researcher in a simple Arabic language to assessthe health needs of patients under the study. It was developed after reviewing the most recent and relevant literature from **(Smeltzer & Bare, 2013 and Wang et al 2018)** and included the following parts:

Part I: Patients' socio-demographic characteristics:

It concerned with assessment of socio- demographic characteristics of the studied patients and included (9 items) covering the following; age, gender, marital status, level of education, employment, place of residence,family responsibility, the number of those responsible for them from the family, andincome.

Part I: Patient's Medical Data:

It was (25 items) used to cover clinical data among the studied patients, that was collected using the hospital medical records andpatients reported including; patient's weight and height, body mass index, past history, family history, presence of systemic diseases, lab values (WBC, RBC, PLT, HB), Cancer- related information (type of cancer, duration of cancer, cancer stage, onset of treatment by chemotherapy, chemotherapy drugs, numberand frequency of treatment cycles), informationabout oral hygiene habits,

Part III: Patients` health needs whichincludes:

Physical needs; it was (19 items) concerned with assessment of patients' pain (location, duration, intensity, its effect on sleep, activities, appetite, using medication to relieve the pain (8 items), and activities of daily living (eating habits and problems, practicing exercise,sleeping habits (11 items).

Psychological needs; by using HamiltonAnxiety Rating Scale (HAM-A) **(Hamilton, 1959 and Maier, et al., 1988 and Borkovec, &Costello, 1993)**, the scale consists of (14 items),each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety), the HAM-A including; Anxious mood, Tension, Fears, Insomnia, Intellectual, Depressed mood, Somatic (muscular), Somatic (sensory), Cardiovascular symptoms, Respiratory symptoms, Gastrointestinal symptoms, Genitourinary symptoms, Autonomic symptoms, and Behavior at interview.

Scoring System for psychological needs:

Each item was scored on a scale of 0 (notpresent) to 4 (severe), with a total score range of0–56, where <17 indicates mild severity, 18–24 mild to moderate severity and 25–56 moderate to severe anxiety.

Social needs; it was (20 items) concerned with assessment of self-confidence (4items), human behavior (7 items) and performance system (9 items).

Spiritual needs; it was (3 items) concerned with; relation with God and motivation.

Educational needs; it was (36 items) concerned with assessment the information about (cancer, types of cancer treatments, chemotherapy and it's side effects, oral side effects during chemotherapy, dental examination, healthy diet for oral health condition, how to strence immunity system (23 items), correct practice for oral hygiene habits (10 items) and using some herbal products for prevent oral mucositis (3 items).

Scoring System:

Physical needs, social needs, and spiritual needs; each item was categorized and scored into either:-

- Always = 2 Sometimes = 1 Never = 0
- Those who obtained less than (50%) wereconsidered to cover the patient's needs.
- From (50% to 70%) were considered tocover little of the patient's needs.
- Those who obtained above (70%) wereconsidered not covering the patient's needs.

Educational needs of the patients, the answer for all 36 items were either Yes (correct)or No (false), the yes answer for each item get

(1) mark and no answer get (zero)

- The satisfactory level = 60 % & more.Meanwhile
- UN satisfactory level = less than 60%.

Tool (II): Oral assessment guide (OAG): An oral assessment guide (OAG) was adopted to assess the existence of mucosal alterations using the validated oral-assessment guide adopted from **(Eilers & Epstein, 2004 and Jaroneski, 2006).** It was (8 items) includedassessment of voice, ability to swallow, lips,tongue, saliva, mucous membranes, gums, and teeth/dentures.

Scoring system

Each category was punctuated with 1(Normal), 2(Slightly abnormal), or 3(Abnormal) points according to their intensity. The eight subscale scores of oral assessment guide are summed to obtain an overall assessment score that ranging from 8-24. The total assessment score was categorized as follows:

- If an overall assessment score was less than9, it denotes healthy oral cavity.
- If an overall assessment score ranges from 9-16, it denotes moderate oral mucositis.
- If an overall assessment score ranges from17-24, it denotes sever oral mucositis.

Tools validity and reliability

The tools were revised by a panel of (7) expertise to assess the tools for clarity, accuracy, relevance, comprehensiveness, understanding, applicability, scoring and items recording. Modifications of tools were done according to the panel's judgment. Testing reliability of the developed tools was done statistically by Cronbach's alpha model which is a model of internal consistency was used in the analysis, the reliability score of tool as above is (0.827, 0.879, 0.858, 0.809, 0.789, 0.744 and 0.818),
While validity score of tools is (0.838, 0.827, 0.857, 0.910, 0.788, 0.837 and 0.755) for patients Psychological needs, Social needs, Spiritual Needs, Educational Needs, Practices, Assessment Guide (OAG). This indicated high total internal consistency of the used tool.

- **Pilot Study:**

It was applied on 7 patients how represent10% of the studied patients to test the applicability and clarity of the tools, as well as to estimate the time needed to fill in the tools. Necessary modifications were done for the used tools and patients included in the pilot study were excluded from the sample group.

Field Work:

Data collections for the sample of this study took about Six months started from February 2022 until August 2022, data were collected on 2 days / week at morning and afternoon shifts in the inpatients' department at Radiotherapy and Nuclear Medicine Department, affiliated to Makkah Hospitals.

- The researcher started by selecting the patients who undergoing chemotherapy and met the

inclusion criteria. The researcher explained the aim and nature of the study to patients prior to data collection in order to take their approval to participate in the study.

- The patient interview questionnaire that includes demographic characteristics, patient's medical data, and patient's needs assessment was filled in by the researcher or the patients or family member according to their level of education. It takes about 30-45 minutes to be filled in for every patient.

  Patient's oral assessment tool was filledin by the researcher only to assess oral condition. It takes about 10-15 minutes to be filled in for every patient.

Administrative Design:

An official permission was obtainedto conduct this study. Patients' oral consent was obtained for data collection after explaining the study.

Ethical considerations:

Prior conducting the pilot study, ethical approval was obtained. In addition oral and written informed consent was obtained from eachparticipant prior to data collection. They were assured that anonymity and confidentiality would be guaranteed and the right to withdraw from the study at any time without giving any reason. Ethics, values, culture and beliefs were respected.

Statistical Design:

The collected data were organized, categorized, tabulated and analyzed using theStatistical Package for Social Sciences (SPSS). Quantitative data were presented as mean, standard deviation. Qualitative data were presented as percentages. The observed differences and association were considered as follows:

- Non-significant at $P > 0.05$
- Significant at $P \leq 0.05$

Results

Table (1): This table shows that (65.71%) of the study sample were aged from 40 to 60 years and the mean age was 46.8±6.25. Male represented a higher percentage (72.9%) of the studied sample. Concerning the educational level, it was found that (28.57%) had higher education. Concerning occupation status more than one third of them (34.28%) were employee. Regarding marital status (71.43%) were married. In relation to residence, more than half of them (68.57%) were from urban area.

Items	N	%
Age (years)		
20 - <40	10	14.29
40 - <60	46	65.71
60 or more	14	20.00
Mean±SD	46.8±6.25	
Sex		
Male	51	72.9
Female	19	27.1
Level of education		
Read and write	22	31.43
Preparatory school	18	25.71

Secondary school	10	14.29
Higher education	20	28.57
Occupation		
Non-working	16	22.86
Employee	24	34.28
Housewife	8	11.43
Free works	12	17.14
Retirement	10	14.29
Marital status		
Single	4	5.71
Married	50	71.43
Divorced	2	2.86
Widowed	14	20.00
Residence		
Rural	22	31.43
Urban	48	68.57

Table (2) illustrates that, 32.86% of the studied patients considered to cover the needs. While, 34.28% of the studied patients considered covering little of the needs and 32.86% of them considered notcovering the needs.

Total Physical needs	**N**	**%**
Considered to cover the needs	23	32.86
Considered to cover little of the needs	24	34.28
Considered not covering the needs.	23	32.86

Table (3) illustrates that, 17.1% of the studied patients had mild level of anxiety. While,18.6% of the studied patients had moderate level of anxiety and 64.3% of them had sever level of anxiety.

Total Psychological Needs (level of anxiety)	**N**	**%**
Mild	12	17.1
Moderate	13	18.6
Severe	45	64.3

Table (4) illustrates that, 32.9% of the studiedpatients considered to cover the needs. While, 35.7% of the studied patients considered covering little of the needs and 31.4% of them considered not coveringthe needs.

Total social needs	**N**	**%**
Considered to cover the needs	23	32.9
Considered to cover little of the needs	25	35.7
Considered not covering the needs.	22	31.4

Table (5) illustrates that, 52.9% of the studiedpatients considered to cover the needs. While, 25.7% of the studied patients considered covering little of the needs and 21.4% of them considered not coveringthe needs.

Total Spiritual needs	N	%
Considered to cover the needs	37	52.9
Considered to cover little of the needs	18	25.7
Considered not covering the needs.	15	21.4

Table (6) illustrates that, 45.7% of thepatients had satisfactory level of educational, were 54.3 % didn't had satisfactory level of educational.

Total educational needs	N	%
Satisfactory	32	45.7
Unsatisfactory	38	54.3

Table (7) shows that 30.0% of the patients had oral mucositis after chemotherapy administration.

OAG	N	%
Healthy oral cavity	49	70.00
Moderate oral mucositis	19	27.14
Sever oral mucositis	2	2.86

Table (8) demonstrate that there was a highly statistically significant difference between total needsand OAG with p-value (<0.001). Also there was positive relation between total needs and OAG with r (0.536).

Items	Total needs	
	r	P-value
OAG	0.536	<0.001**

Discussion:

The finding of the current study revealedthat, two-thirds of the study sample was aged from 40 to 60 years and the mean age was 46.8±6.25. This result might be due to this age group considered high risk for exposure to cancer due to old age had low immunity and poor nutritional status. This result was consistent with the findings of Soliman & Shehata (2015), who reported that the study sample's mean age was 42.93..

Concerning gender and marital status, nearly three quarters of the studied sample were male and married this finding may be due to that some types of cancer as (Colorectal, Gastric and Pancreatic cancer) occurs in males than females, Lucchese et al. (2016), who found that most of the patients under study were married men, corroborate this opinion..

Concerning the educational level, it was found that more than one quarter of studied sample was university graduate. In relation to income, more than half of them were with insufficient income. In the same field, **Abd Allah et al., (2020)** who revealed that slightly less than one-thirds of studied cancer patients had high education. Also, half of them had not sufficient income. The explanation of such result is that lower socioeconomic status is associated with less access to healthcare services (as screening program) to detect early signs of cancer disease.

Concerning occupation status more than one third of them were employee. In relation to residence, more than half of them were from urban area. These results were agreement with **Araújo et al., (2015)** who stated that, less than half of cancer patients were working. Also, more than half of them residing in urban areas

Only one-third of the patients' physical needs were met, according to the results of the current study. This outcome was in line with the findings of Oldenmenger et al. (2018), who noted that prior to educational interventions aimed at improving cancer-related oral mucositis, cancer patients had physical demands.

Related to psychological needs (level of anxiety) among the studied patients, the current study revealed that more than half of studied patients had severity degree of anxiety. This result may be due to the first time of chemotherapy session being able to be emotional and overwhelming for the patients. This result was agreement with **Krishnaswamy& Nair., (2016)** about "Effect of music therapy on pain and anxiety levels of cancer patients" and revealed that there was a statisticallysignificant reduction in the post intervention pain scores and anxiety in the test group compared to the control group.

regarding the social requirements of the patient According to the current study, just about one-third of the patients' physical demands were met. This outcome was in line with the findings of Agboola et al. (2015), who noted that prior to technology-based interventions, cancer patients had social requirements.
regarding the spiritual requirements of the patient According to the current study, just about 25% of the patients' spiritual demands were met. This outcome was consistent with the findings of Kassianos et al. (2018), who noted that during specialist palliative care, cancer patients have spiritual requirements.

According to total distribution of educational needs among the studied patients, the current study revealed more less than half ofthe patients had unsatisfactory level of educational about the cancer and itscomplications. This result was agreement with **Dadgary & Zareian., (2017)** who demonstrate that there was a marked poor in patient's knowledge regarding chemotherapy problems pre the training programs.

Regarding to total oral assessment guide (OAG) among studied patients, the current study revealed that about one thirds of the patients had oral mucositis after chemotherapy administration, this result may be due to patients with cancer undergoing chemotherapy frequently developing alterations of the oral cavity. Oral debris is composed of soft foreign matter loosely attached to teeth. It consists of mucin, bacteria, and food. This finding was in conjunction with study done by **Acharya et al., (2017)** who mentioned that more than one third of studied patients had oral changes aftersession of chemotherapy.

Regarding to correlation between totalpatients' needs and oral assessment guide (OAG), the current study revealed that there was a highly statistically significant difference between total patients' needs and OAG. This may be due to when the patient's needs (physical, psychological, social, spiritual) increase, the degree of oral mucositis increases. This finding is incongruence with **Dadgary & Zareian., (2017)** who revealed that there was a positive relation between total needs and oral assessment guide.

Conclusion

The current study found that the majority of the patients under investigation required medical, psychological, social, spiritual, and educational support. furthermore experienced a change in

oral health following chemotherapy treatment.

Recommendations:
The result of this study projected thefollowing recommendations:

- Replication of the current study on a larger probability sample is recommended to achieve generalization of the results.
- The current study recommended that, developing of guidelines protocol as regard reducing chemotherapy induced oralmucositis based on patient's needs.

Reference:

Abd Allah, E., Gad, H. M., & Abdel-Aziz, H. (2020). Nutritional Status and Its Contributing Factors among Older Adults with Cancer Receiving Chemotherapy.Clinical Nursing Research, 29(8), 650-658.

Acharya, S., Pai, KM., Bhat, S., Mamatha,B., Bejadi, VM., Acharya, S. (2017). Oral changes in patients undergoing chemotherapy for breast cancer. Indian J Dent Res.;28:261-268.

Agboola, S. O., Ju, W., Elfiky, A., Kvedar, J. C., & Jethwani, K. (2015). The effect of technology-based interventions on pain, depression, and quality of life in patientswith cancer: a systematic review ofrandomized controlled trials. Journal ofmedical Internet research, 17(3), e65.

Araújo, S. N., Luz, M. H., Silva, G. R., Andrade, E. M., Nunes, L. C., & Moura, R. O. (2015). Cancer patients with oral mucositis: challenges for nursing care. Revista latino-americana de enfermagem, 23(2), 267-274.

Borkovec, T., & Costello, E. (1993). Efficacy of applied relaxation and cognitivebehavioral therapy in the treatment of generalized anxiety disorder. J Clin Consult Psychol 61(4):611–19.

Chan, C.W, Law, B.M, Wong M.M, ChanDN, & Chow, KM (2020). Oral mucositis among Chinese cancer patients receiving chemotherapy: Effects and management strategies. Asia-Pacific Journal of ClinicalOncology, 1–8. https://doi.org/10.1111/ajco.13349.

Dadgary, F., & Zareian, A. (2017). The effect of training programs based on the patients' needs on knowledge and attitude of patients about chemotherapy. Military Caring Sciences Journal, 4(2), 138-146. 5-1093. doi: 10.1188/06.ONF.1085-1093.

Eilers, J., & Epstein, J., (2004). Assessment and measurement of oral mucositis. Seminars in Oncology Nursing, 20(1), 22-29.

Hamilton, M. (1959). The assessment of anxiety states by rating. Br J Med Psychol 1959; 32:50–55.

Jaroneski, L. (2006). The importance of assessment rating scales for chemotherapy- induced oral mucositis. Oncology NursingForum, 33, 108. Indian journal of palliative care, 22(3), 307.

Kassianos, A. P., Ioannou, M., Koutsantoni, M., & Charalambous, H. (2018). The impact of specialized palliative care on cancer patients' health-related quality of life: a systematic review and meta-analysis. Supportive Care in Cancer, 26(1), 61-79.

Krishnaswamy, P., & Nair, S. (2016). Effect of music therapy on pain and anxiety levels of cancer patients: a pilot study.

Lucchese, A., Matarese, G., Ghislanzoni, L. H., Gastaldi, G., Manuelli, M., &Gherlone, E. (2016). Efficacy and effects ofpalifermin for the treatment of oral mucositis in patients affected by acute lymphoblastic leukemia. Leukemia & Lymphoma, 57(4), 820-827.

Maier, W., Buller, R., Philipp, M., Heuser, I. (1988). The Hamilton Anxiety Scale:reliability, validity and sensitivity to change in anxiety and depressive disorders. J Affect Disord , 14(1):61–8.

O'Neill, S., Mirza, HN., & Younus, J. (2020). Management of Chemotherapy andRadiation-Induced Oral Mucositis in CancerPatients, Journal of Cancer Research & Clinical Practice, 3(1): 113.

Oldenmenger, W. H., Geerling, J. I.,Mostovaya, I., Vissers, K. C., de Graeff, A., Reyners, A. K., & van der Linden, Y. M. (2018). A systematic review of the effectiveness of patient-based educational interventions to improve cancer-related pain.Cancer treatment reviews, 63, 96-103.

Sahni, P., Punyani, SR., Jain, S., Nayak, KC.,Charan, A., & Karwasra, K. (2020). Oral alterations and oral health-related quality of life assessment in patients undergoing chemotherapy at a tertiary care center.Special Care in Dentistry, 40(5), 450-456.

Scott, E., & Jewell, A. (2020). Supportive care needs of people with pancreatic cancer: a literature review. Cancer Nursing Practice, 19(3).

Smeltzer, S., & Bare, B. (2013). Textbook ofmedical-surgical nursing Medical-Surgical Nursing. 13th ed., Philadelphia: lippinocott Comp.

Soliman, G., & Shehata, O. (2015): Efficacy of Cryotherapy on Oral Mucositis Prevention among Patients with Head and Neck Cancers. Journal of Nursing andHealth Science, 4(4), 53-61.

Wang, T., Molassiotis, A., Chung, B. P., & Tan, J. Y. (2018). Unmet care needs of advanced cancer patients and their informal caregivers: a systematic review. BMC palliative care, 17(1), 96.

Wolyniec, K., Sharp, J., Lazarakis, S., Mileshkin, L., & Schofield, P. (2020). Understanding and information needs of cancer patients regarding treatment-focused genomic testing: A systematic review. Psycho-Oncology, 29(4), 632-638.