

Experience of pain among patients with cognitive disorders

Iwona Barbara Repka¹, Aleksandra Mental¹, Grażyna Puto², Patrycja Zurzycka¹

¹Department of Clinical Nursing, Institute of Nursing and Midwifery, Faculty of Health Sciences, Jagiellonian University Medical College, Kraków, Poland

²Department of Internal and Environmental Nursing, Institute of Nursing and Midwifery, Faculty of Health Sciences, Jagiellonian University Medical College, Kraków, Poland

Abstract

Introduction: Cancer pain is the most prevalent symptom among patients diagnosed with oncological disease. Pain complaints can occur at any stage of the disease, significantly impacting patient functioning. An additional challenge that arises when trying to assess the severity of pain is the cognitive impairment that can occur in palliative patients. Pain control is a key component of palliative treatment, and effective assessment is a cornerstone of planned therapy. The purpose of this study was to assess pain among patients with cognitive impairment hospitalized in an inpatient palliative medicine unit and examine its impact on their functional status.

Material and methods: The method used in the study is a diagnostic survey with purposive group selection. The techniques that were used are a questionnaire and analysis of medical records. Standardized tools including the Doloplus-2 pain assessment questionnaire, the Behavioural Rating Scale, the Critical Care Pain Observation Tool questionnaire, and the Abbreviated Mental Test score (for qualifying patients) were used to conduct the survey.

Results: The study revealed statistically significant correlations between the functional status of patients with cognitive impairment and the presence of pain. However, no correlations were observed between gender, age, primary tumour location, and pain complaints.

Conclusions: Patients who score higher on functional performance scales are patients who experience pain. The Doloplus-2 scale is a more effective tool for assessing pain occurrence in palliative patients.

Key words: cancer pain, cognitive impairment, functional status, Doloplus-2 pain assessment questionnaire, palliative care, Behavioural Rating Scale.

Address for correspondence:

Iwona Barbara Repka, MD, PhD, Department of Clinical Nursing, Institute of Nursing and Midwifery, Faculty of Health Sciences, Jagiellonian University Medical College, 25 Kopernika St., 31-501 Kraków, Poland, e-mail: iwona.repka@uj.edu.pl

INTRODUCTION

Pain is a subjective and complex phenomenon, with a variety of pathomechanisms, which accompanies patients at every stage of malignant disease, with particular intensity in the end-stage [1, 2]. Along with the experience of mainly chronic pain, cognitive disorders, which develop in patients undergoing palliative treatment and account for both primary and secondary lesions localized in the brain, constitute a significant problem. Psychological limitations such as depression and anxiety can also contribute to the presence of cognitive disorders, which affect verbal memory and information processing impairment, as well as minor motor impairment. Other significant symptoms that change their dynamics at different stages of the disease include disorientation and adaptive difficulties, which are largely related to the patient's self-sufficiency and the need to rely

on others. Emerging cognitive impairments may indicate neurodegenerative progression of the disease and deterioration of the patient's health, which affect the quality of life. In the case of misdiagnosis, they can be a burden on functioning in daily life [3–7]. The care of a patient with cognitive disorders should focus on the diagnosis and identification of the disorders because this allows the initial recognition of any communication limitations, which may be manifested during conversation, e.g. inconsistency of spoken sentences and the omission of individual elements. Also, patients provide little information and their speech appears chaotic. An important element in comprehensive patient care is the inclusion of family/caregivers to improve the care process [8–10].

The aim of this study is to evaluate the experience of pain and functional status among cognitively impaired patients hospitalized in the Palliative Medicine Ward.

MATERIAL AND METHODS

The study was carried out at the City Care Centre for the Elderly, Chronically Disabled, and Independent Persons in Krakow's Inpatient Department of Palliative Medicine. It covered 80 patients on the day of admission to the ward. The study included patients diagnosed with malignant disease, with cognitive impairment of mild level, who scored between 4 and 6 on the abbreviated mental test score (AMTS). Patients with severe or mild cognitive impairment (AMTS < 4 points or > 6 points) were excluded from the study [11].

The Doloplus-2 pain assessment questionnaire, the Critical Care Pain Observation Tool (CCPOT) questionnaire, and the Behavioural Rating Scale (BRS) were used to conduct the study.

The Doloplus-2 pain assessment questionnaire was used to evaluate the patients' pain along with the reactions arising from the pain experience. The sheet was filled out by medical staff based on observations of the patients' behaviour. The questionnaire consists of 10 items covering 3 categories: somatic reactions (including somatic complaints, defensive posture, protection of painful areas, facial expression, and sleep), psychosomatic reactions (including daily activities such as dressing and washing and ability to move), and psychosocial reactions (including social life, behavioural problems, and communication). Each of the individual items is determined using a 0–3-point scale. A maximum of 30 points can be obtained by the patient, and in the case of scores ≥ 5 points, the presence of pain is assumed. The questionnaire for behavioural pain evaluation can be used to evaluate the occurrence of pain among patients with dementia or cognitive impairment, or among the elderly [12].

At the same time, the CCPOT questionnaire was used to evaluate the occurrence of pain in patients, which takes into account the following components: facial expressions, body movements, muscle tension, and verbal contact. It is mainly applicable to mechanically ventilated patients, but it also allows for effective evaluation of pain in non-intubated patients, especially among those who do not have the ability to verbally assess the pain they experience. In each criterion, the patient can obtain 0–2 points, which indicates varying levels of pain or behaviour. A maximum of 8 points can be obtained by the patient, while a score of ≥ 3 points indicates the presence of pain [13].

Functional status was verified using the BRS, which evaluates changes in the patient's functioning during hospitalization. The scale evaluates the patient for activities such as washing/dressing, moving around, incontinence of urine/stool, staying in bed during the day, disorientation, and taking care of physical appearance independently. The Be-

havioural Rating Scale helps to assess the patient's functional status and provide appropriate care adapted to the patient's needs. The questionnaire is very useful for elderly patients with cognitive impairments and patients unable to function independently. The scores obtained from the measurements are not compiled with specific norms, but the dynamics of change in specific areas of patient functioning are assessed on their basis [14].

Statistical analysis

Non-parametric tests, which do not require assumptions on the distribution of population random variable, were used to conduct the calculations. In total, the following tests were used for all calculations: the Mann-Whitney *U* test and Spearman's rank correlation coefficient. Calculations were conducted in SPSS 22 software, and a significance level of $p < 0.05$ was assumed for all tests.

RESULTS

The study covered 80 patients, including 41 women (51%) and 39 men (49%). The World Health Organization criteria dividing age were adopted in the analysis. On their basis, the onset of old age begins as early as 60 years of age, early old age is defined by the range between 60 and 74 years of age, late old age between 75 and 89 years of age, while those who have reached the age of 90 and above are considered to be in the longevity period. The survey included 4 patients under the age of 60 years (5%), 31 patients were in the age range of 60–74 years (39%), 40 patients were in the range of 75–89 years (50%), while over the age of 90 years included 5 patients (6%). The mean age of the patients was 75.13 years (SD = 9.96). The mean age of women in the study (73.66 years) was not statistically significantly different ($p = 0.1787$) from the mean age of men (76.67 years) (Table 1). Calculations were conducted using the Mann-Whitney *U* test ($p < 0.05$).

Table 1. Results of statistical analysis between sex and age in the study group

Parameters	Age				
	N	M	SD	Min.	Max.
Sex					
Women	41	73.66	11.11	50	98
Men	39	76.67	8.47	62	94
Total	80	75.13	9.96	50	98
<i>p</i> -value			0.1787		

M – mean, *Min.*–*Max.* – minimum–maximum Mann-Whitney *U* test, *N* – number of subjects, *p* – statistical value, *SD* – standard deviation, $p \leq 0.05$

Table 2. Categories of functional status on the behavioural rating scale

Parameters	Behavioural rating scale						Total
	Area I	Area II	Area III	Area IV	Area V	Area VI	
M	1.56	1.75	1.70	1.71	1.29	1.31	9.33
SD	0.67	0.56	0.58	0.53	0.46	0.77	2.85

Area I – washing/dressing, Area II – moving around, Area III – incontinence of urine/stool, Area IV – staying in bed, Area V – disorientation, Area VI – taking care of physical appearance, M – mean, SD – standard deviation

Table 3. Results of statistical analysis between components of the Behavioural Rating Scale and categories of the Doloplus-2 questionnaire

Parameters	Components of the Behavioural Rating Scale	Categories of the Doloplus-2 questionnaire			Total
		Somatic reactions	Psychosomatic reactions	Psychosocial reactions	
Area I	Rho	0.314	0.150	0.283	0.313
	<i>p</i>	0.0045	0.1834	0.0108	0.0047
Area II	Rho	0.275	0.219	0.209	0.280
	<i>p</i>	0.0135	0.0512	0.0632	0.0120
Area III	Rho	0.272	0.213	0.243	0.293
	<i>p</i>	0.0147	0.0579	0.0299	0.0084
Area IV	Rho	0.348	0.289	0.239	0.350
	<i>p</i>	0.0016	0.0094	0.0326	0.0014
Area V	Rho	0.329	0.147	0.346	0.310
	<i>p</i>	0.0028	0.1939	0.0017	0.0052
Area VI	Rho	0.390	0.262	0.367	0.407
	<i>p</i>	0.0004	0.0189	0.0008	0.0002
Total	Rho	0.469	0.285	0.428	0.470
	<i>p</i>	< 0.0001	0.0105	0.0001	< 0.0001
	<i>N</i>	80	80	80	80

Area I – washing/dressing, Area II – moving around, Area III – incontinence of urine/stool, Area IV – staying in bed, Area V – disorientation, Area VI – taking care of physical appearance, *N* – number of subjects, *p* – statistical value for Spearman's rho correlation, $p \leq 0.05$

Patients were eligible for the study regardless of the type of malignant disease. Patients with the following malignancies were included in the study (primary tumour location was considered): cancers of the gastrointestinal tract (including cancers of the stomach, large intestine, gallbladder and biliary tract, and liver) – 21 patients (36%); cancers of the respiratory tract (including cancers of lungs and larynx) – 18 patients (30%); cancers of the genitourinary tract (including cancers of kidney, bladder, ovaries, prostate and uterine cancers) – 21 patients (36%); brain cancers – 10 patients (17%); and other cancers (including cancers of hematopoietic system, lymphatic system and breast cancers) – 10 patients (17%).

Evaluation of the subjects' pain

Verification of pain based on selected scales provided different results. The use of the Doloplus-2 pain assessment questionnaire indicated that pain was present in 60 patients (75%). For the CCPOT questionnaire, the result differed significantly, as pain

was noted in only 43 patients (54%). The Doloplus-2 pain assessment questionnaire showed greater sensitivity to the presence of pain in the study group.

Evaluation of the subjects' functional performance

Verification of functional status on the BRS indicates the highest values in the areas of mobility (1.75), incontinence (1.70), and staying in bed (1.71). Detailed results are shown in Table 2.

Analysis of the relationship between behavioural rating scale scores and the Doloplus-2 pain assessment questionnaire

Significant positive correlations were found between BRS and functional status in the areas of somatic reactions ($p < 0.0001$), psychosomatic ($p = 0.0105$) social ($p = 0.0001$) and general index ($p < 0.0001$) based on the Doloplus-2 pain assessment questionnaire.

Table 4. Results of statistical analysis between components of the behavioural rating scale and categories of the Doloplus-2 questionnaire/Critical Care Pain Observation Tool questionnaire

Parameters		Doloplus-2 questionnaire			Critical care pain observation tool questionnaire		
Components of the behavioural rating scale		Non-pain	Presence of pain	Total	Non-pain	Presence of pain	Total
Area I	M	1.20	1.68	1.56	1.35	1.74	1.56
	SD	0.77	0.60	0.67	0.72	0.58	0.67
	<i>p</i>			0.0040		<i>p</i>	0.0035
Area II	M	1.50	1.83	1.75	1.65	1.84	1.75
	SD	0.69	0.49	0.56	0.63	0.48	0.56
	<i>p</i>			0.0070		<i>p</i>	0.0883
Area III	M	1.45	1.78	1.70	1.57	1.81	1.70
	SD	0.69	0.52	0.58	0.65	0.50	0.58
	<i>p</i>			0.0127		<i>p</i>	0.0325
Area IV	M	1.45	1.80	1.71	1.54	1.86	1.71
	SD	0.60	0.48	0.53	0.61	0.41	0.53
	<i>p</i>			0.0041		<i>p</i>	0.0036
Area V	M	1.15	1.33	1.29	1.19	1.37	1.29
	SD	0.37	0.48	0.46	0.40	0.49	0.46
	<i>p</i>			0.1190		<i>p</i>	0.0733
Area VI	M	0.90	1.45	1.31	1.03	1.56	1.31
	SD	0.79	0.72	0.77	0.80	0.67	0.77
	<i>p</i>			0.0058		<i>p</i>	0.0020
Total	M	7.65	9.88	9.33	8.32	10.19	9.33
	SD	3.00	2.59	2.85	2.91	2.53	2.85
	<i>p</i>			0.0014		<i>p</i>	0.0006

Area I – washing/dressing, Area II – moving around, Area III – incontinence of urine/stool, Area IV – staying in bed, Area V – disorientation, Area VI – taking care of physical appearance, M – mean, SD – standard deviation, *p* – statistical value Mann-Whitney U test, $p \leq 0.05$

The exception was the correlation between BRS values and psychosomatic relations, for which only 2 out of 6 were confirmed (for area IV $p = 0.0094$ and for area VI $p = 0.0189$) (Table 3).

Patients with pain complaints evaluated according to the Doloplus-2 pain assessment questionnaire represent individuals with a higher overall BRS score ($p = 0.0014$) and higher values in all areas except for the component relating to the disorientation level.

Comparison of results based on the CCPOT questionnaire and the BRS showed that patients with pain reported higher scores on the BRS ($p = 0.0006$), especially in the area relating to washing and dressing ($p = 0.0035$), control of physiological needs ($p = 0.0325$), staying in bed ($p = 0.0036$), and independence in taking care of their own physical appearance ($p = 0.0020$) (Table 4).

DISCUSSION

Pain is a subjective symptom that accompanies patients with various conditions. Its severity, type,

or location varies depending on the diagnosed disease, as well as the patient's tolerance. Pain can be caused not only as a result of an ongoing disease process, but also by treatment or past trauma. A special type of pain worth paying attention to is pain accompanying malignant disease. It has various causes and can be treated in many methods. To effectively plan treatment, it is necessary to carry out a correct and detailed evaluation of the patient's pain, which requires consideration of many aspects and factors that determine its severity and nature. Patients who are conscious and in logical contact, and who have the ability to accurately provide information related to their condition, will certainly find the task of history-taking easier than those who are cognitively impaired, having difficulty in communicating their own needs or over-manifesting through various signals. Evaluation of pain in such patients is a challenge that palliative care nurses face in daily practice.

According to our study, up to 75% of patients experience pain (evaluation based on the Doloplus-2 pain assessment questionnaire). Separate results were obtained with the CCPOT questionnaire, which indi-

cated that only 54% of respondents experience pain. The differences observed may be due to the better adaptation of the CCPOT questionnaire to Intensive Care Units, where intubated patients are handled. However, the study indicates that the CCPOT questionnaire is also useful for patients in other wards, with whom contact is difficult, and who do not have the opportunity to verbally express their pain sensations, so the only evaluation method is behavioural observation. The Doloplus-2 pain assessment questionnaire has undoubtedly proven better at evaluating pain in palliative patients with cognitive impairment than the CCPOT scale. The Doloplus-2 pain assessment questionnaire accurately reports the presence of pain by taking into account 3 groups of patient responses to such sensations. Its only disadvantage is the long time to fill it out compared to the CCPOT questionnaire, although the advantages of its use outweigh the difficulties involved with filling it out.

Similar conclusions were presented by Pautex *et al.* (2007), noting the time-consuming nature of the survey tool used, along with a proposal to reduce it with internal consistency and efficiency [15].

A study by Janecki *et al.* (2009) showed the importance of using the Doloplus-2 scale in the evaluation of pain among patients with cognitive impairment. The authors of the paper pay special attention to the necessity of using a scale assessing cognitive impairment in palliative patients before pain evaluation. The results obtained in the evaluation of pain coincide with those obtained in our own study [16].

A study conducted by Dube *et al.* (2018) analysed the difference in the level of cognitive impairment for patients with malignant disease residing in nursing homes. It was found that 55% of patients with mild cognitive impairment experienced pain, as did 50% with severe impairment. The main conclusion of the study was that greater cognitive impairment was associated with a reduced incidence of pain of any type, indicating the need for evaluation of cognitive impairment alongside pain evaluation [17].

The analysis of our results showed the existence of a relationship between functional status assessed by the BRS and pain verified by the Doloplus-2 pain assessment questionnaire among the subjects. It was shown that patients who experience pain achieve higher scores within the functional evaluation scale, with the exception of area V relating to the disorientation level. Meanwhile, the comparison of individual areas of the Doloplus-2 pain assessment questionnaire with areas of the BRS showed significant correlations in somatic reactions ($p < 0.0001$), psychosomatic reactions ($p = 0.0105$), social relations ($p = 0.0001$), and overall BRS score ($p < 0.0001$).

Similar results in the correlation between functional status and the occurrence of pain were obtained by Kulpa *et al.* (2013), who showed that patients

experiencing pain have a reduced quality of life. Noteworthy is the achievement of a negative correlation between pain and subjective and objective quality of life, which translates into a better functional state in the physical and emotional areas among patients with less severe cancer pain [18].

Cancer pain is the most common symptom reported by patients diagnosed with malignant disease, and although there are a lot of papers or systematic reviews on the pain evaluation in oncology patients, a small number are devoted to patients with cognitive impairment. A symptom such as cognitive impairment can undoubtedly accompany malignant disease at any stage. Often such disorders affect the patient's ability to evaluate pain, and therefore affect proper pain management. An important part of the medical staff's job is to identify pain in a patient, especially one who will not verbally communicate the information, or it will be inadequate for the patient's behaviour. A study involving the evaluation of pain experienced by patients with malignant disease would need to be expanded to include pain treatment (type, dose of medications taken), frequency and intensity of pain, and the need for ad hoc pain medication. The side effects of ongoing analgesic treatment in cognitively impaired patients receiving palliative care could also be an additional field of study [19].

A significant limitation that affected the conduct of the study was the lack of continuous patient monitoring and the impossibility of comparing the obtained results at specific time intervals. However, the results obtained can help medical personnel in the correct selection of standardized tools for pain evaluation in Palliative Medicine Units, as well as raise awareness of the need for reliable patient evaluation during admission and stay.

CONCLUSIONS

In the study group, the Doloplus-2 pain assessment questionnaire undoubtedly showed better evaluation of pain among palliative patients with cognitive impairment than did the CCPOT scale. There is a correlation between the presence of pain and the functional status of the subjects, especially in the somatic and psychosomatic areas, as well as social relations.

The authors declare no conflict of interest.

REFERENCES

1. Wordliczek Ł, Dobrogowski J. Leczenie bólu. Wydawnictwo Lekarskie PZWL, Warszawa 2017, 1-16.
2. Kotlińska-Lemieszek A, Ciałkowska-Rysz A. Ból u pacjentów z chorobą nowotworową. Przyczyny, patofizjologia, klasyfi-

- kacja i diagnostyka. Farmakoterapia bólu. [In:] Walden-Gałuszko K, Ciałkowska-Rysz A (ed.). Opieka Paliatywna. Wydawnictwo Lekarskie PZWL, Warszawa 2015, 59-101.
3. Ball HA, McWhirter L, Ballard C, et al. Functional cognitive disorder: dementia's blind spot. *Brain* 2020; 143: 2895-2903.
 4. Petersen RC, Lopez O, Armstrong MJ, et al. Practice guideline update summary; mild cognitive impairment; report of the guideline development, dissemination, and implementation subcommittee of the American Academy of Neurology. *Neurology* 2018; 90: 126-135.
 5. McWhirter L, Ritchie C, Stone J, et al. Functional cognitive disorders: a systematic review. *Lancet Psychiatry* 2020; 7: 191-207.
 6. Sue K, Mazzotta P, Grier E. Palliative care for patients with communication and cognitive difficulties. *Can Fam Physician* 2019; 65: 19-24.
 7. Pendergrass JC, Targum SD, Harrison JE. Cognitive impairment associated with cancer: a brief review. *Innov Clin Neurosci* 2018; 15: 36-44.
 8. Santos T, Lovell J, Shiell K, et al. The impact of cognitive impairment in dementia on self-care domains in diabetes: a systematic search and narrative review. *Diabetes Metab Res Rev* 2018; 34: 1-16.
 9. Liao YY, Chen IH, Lin YJ, et al. Effects of virtual reality-based physical and cognitive training on executive function and dual-task gait performance in older adults with mild cognitive impairment: a randomized control trial. *Front Aging Neurosci* 2019; 11: 1-8.
 10. Kózka M, Gibadło E, Padykuła M. Uwarunkowania występowania zaburzeń funkcji poznawczych u pacjentów w wieku geriatrycznym hospitalizowanych na oddziale chorób wewnętrznych. *Pielęg Pol* 2018; 3: 277- 283.
 11. Romanik W, Łazarewicz M. Wersja polska Skróconego Testu Sprawności Umysłowej (AMTS) – problemy metodologiczne. *Psychiatr Psychol Klin* 2017; 17: 203-207.
 12. Widenka M. Zastosowanie fentanylu drogą przeskórną i w postaci tabletek podjęzykowych w leczeniu bólu u chorych w podeszłym wieku z zespołem otępiennym. *Palliat Med Pract* 2020; 14: 34-38.
 13. Wojnar-Gruszka K, Sega A, Płaszewska-Żywko L, et al. Pain assessment with the BPS and CCPOP Behavioral Pain Scales in mechanically ventilated patients requiring analgesia and sedation. *Int J Env Res Public Health* 2022; 19: 1-13.
 14. De Walden-Gałuszko K, Majkowicz M. Model oceny jakości opieki paliatywnej realizowanej w warunkach stacjonarnych. *Wyd. Zakład Medycyny Paliatywnej AMG, Gdańsk* 2001, 65-66.
 15. Pautex S, Herrmann RF, Michon A, et al. Psychometric properties of the Doloplus-2 Observational Pain Assessment Scale and comparison to self-assessment in hospitalized elderly. *Clin J Pain* 2007; 23: 774-779.
 16. Janecki M, Janecka J. Behawioralna ocena bólu u pacjentów z zaawansowaną chorobą nowotworową objętych stacjonarną opieką paliatywną. *Med Paliat* 2009; 1: 27-32.
 17. Dubé CE, Mack DS, Hunnicutt JN, et al. Cognitive impairment and pain among nursing home residents with cancer. *J Pain Symptom Manage* 2018; 55: 1509-1518.
 18. Kulpa M, Stypuła-Ciuba B. Ból nowotworowy i uciążliwość objawów somatycznych a jakość życia u pacjentów z chorobami nowotworowymi. *Med Paliat* 2013; 5: 171-179.
 19. Snijders RAH, Brom L, Theunissen M, et al. Update on prevalence of pain in patients with cancer 2022. A systematic literature review and meta-analysis. *Cancers* 2023; 15: 1-39.