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ORIGINAL PAPER

PAIN ASSESSMENT IN SURGICAL PATIENTS IN THE SOUTH BOHEMIA REGION

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Abstract

Aim: The aim of the study was to describe the current state of pain assessment in surgical patients in the South Bohemia region. *Design:* A quantitative descriptive study. *Methods:* Two sets of questionnaires were used to determine the state of pain assessment. The sample included 253 nurses and 205 patients from the South Bohemia region. *Results:* Nurses use visual analog scales (129) and verbal pain assessment (89) to assess pain. A more precise verbal description of pain assessment would be appreciated by 44 of the respondents, and 42 would appreciate confirmation of assessments by doctors. According to nurses, the main pain manifestations in patients are: limited mobility (156), verbal expressions (134), lack of cooperation (129) and limited independence (128). Direct physical manifestations of pain mentioned by patients include: limited mobility (140), limited independence (97), and mimic manifestation (46). Patients would like pain assessments complemented by more accurate verbal assessments (84), use of pictures to illustrate pain (40), and increased frequency of assessment by doctors (29). *Conclusion:* The data obtained suggest some shortcomings in pain assessment, and indicate the spheres in which provision of care could be improved.

Keywords: assessment scales, nurse, pain, pain assessment, surgical patient.

Introduction

Pain is an experience inseparably associated with human life. It can be of various dimensions, intensity, and purpose. Attempts at pain control, relief, and removal have existed since the beginning of humanity; for example, objects and drawings from the stone age indicate that attempts were made to relieve pain by stimulation of particular spots on the body using fish bones (Hřib & Hakl, 2005). The International Association for the Study of Pain (IASP) defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage". Pain is subjective, and, in the course of their lives, humans learn through experience how to describe it, what it is caused by, and how to eliminate it. If an individual is not able to communicate verbally, he/she can express painful experiences in different ways (IASP, 2017). However, pain is not just an unpleasant feeling – it can also serve as a warning to the organism to rescue itself, to escape from the cause of pain, to avoid long-term damage,or to change behavior in a way that supports the healing of tissue (Daneš, 2018; Honzák, 2005).

The sources of pain are as varied as its purposes. Pain can be caused by chemical, biological, and physical factors, or by mental disorders (Rokyta et al., 2009). Honzák (2005) states that it is necessary to realize that the person, not just the pain, is treated. Those suffering from pain express it in certain ways through their behaviors. To understand it better, pain can be divided into several interconnected levels – biological, psychological, and social – more than one of which can be a source of pain simultaneously. Kumar and Elavarasi (2016), in a systematic review, point to various definitions of pain and various meanings of the terms "pain" and "suffering". Suffering is perceived as the experience of pain, which is very different to the definition of pain itself. Pain is perceived as a multidimensional entity, equally involving the central nervous system, cognition, and the emotions, and can be acute or chronic. It is important to identify types of pain when selecting interventions to eliminate it effectively.

Rokyta et al. (2009) state that pain can be encountered in a hospital setting much more frequently than elsewhere. In spite of the current

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progress in medicine, acute postoperative pain is treated inadequately in some hospitals. They found that 10–20% of patients, after selected abdominal or orthopedic surgeries, left hospital the same day with unacceptable pain. Three-quarters of patients suffered moderate to severe postoperative pain. This is also confirmed by the conclusions of a prospective study published by Campagna et al. (2016). In this study, the sample included 276 patients from three different surgical departments at hospitals in Piedmont, Italy, who had undergone surgery in an outpatient regimen. The patients were monitored for seven days, with the day of surgery as day 1. In the course of the monitored period, patients recorded their pain score twice a day. Furthermore, they recorded the medication prescribed and the pain that had caused them to go to the hospital. The study results show that 72% of the patients were discharged from hospital with mild opiates, 17% required further medicaments, and 15% reported they had later contacted the hospital again due to pain. The authors claimed that when discharged, most of the monitored patients were suffering from pain which could have been eliminated by appropriate pain management. Pain experienced on returning to everyday life after same-day surgery is also studied by Rosén et al. (2011), and by Pavlin et al. (2004), who included 175 patients from various surgical groups (e.g., hernia surgeries, pelvic laparoscopy, knee arthroscopy, etc.) in their research.

In a review study, Gupta et al. (2010) highlight the importance of assessment of pain in surgical patients. They point out that if pain is present in the perioperative period, it is probable that it will be more pronounced in the postoperative period. As simple evaluation scales for pain, they include visual analogue scales, numerical rating scales, verbal rating scales, and multidimensional pain scales (such as the McGill Pain Questionnaire, the Brief Pain Inventory, or the Memorial pain assessment card). In "Management of postoperative pain: a clinical practice guideline from the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council", Chou et al. (2016) stress that preoperative, intraoperative, and postoperative interventions and management strategies are available for the elimination of pain. Detailed knowledge of the history of patients' health and previous experience of surgery and postoperative treatment is necessary for interventions to be effective. In "Recommendation five" of their guidelines, the authors describe methods of assessment. In addition, they state that pain assessment can help in evaluating the quality of pain management (whether it is adequate or inadequate). For the effective evaluation of pain, it is necessary to use a validated pain assessment tool. Gupta et al. (2010) suggest using visual analogue scales, numeric or verbal rating scales, symbols, and others.

Aim

The aim of the article is to show the current state of pain assessment in surgical patients in the South Bohemia region from the points of view of surgical nurses and surgical patients, and to outline areas regarded as problematic by nurses and patients.

Methods

Design

A quantitative descriptive study.

Sample

The sample consisted of patients hospitalized in surgical departments, and nurses employed by surgical departments in the South Bohemia region. The respondents were selected intentionally. The selection criteria included a demographic aspect (the South Bohemia region), patient age (15+), patients treated in a surgical department, and, for nurses, employment in a surgical department. The respondents were informed about the questionnaires and the purpose of the study. Participation was voluntary, and the questionnaire did not contain any controversial questions.

Three hundred twenty questionnaires designed for nurses working in surgical departments were distributed, of which 253 (79.06%) were returned. The same number of patient questionnaires were distributed (320), of which 218 (68.13%) were returned, with 13 uncompleted questionnaires excluded. The resulting sample of nurses included 253 respondents (Table 1), six of whom were male (2.4%) and 247 female (97.6%). The resulting patient sample contained 205 respondents (Table 1): 91 men (44.4%) and 114 women (55.6%). The categorization of data to describe the research sample was based on the previous experience of the research team, and consultation with a statistician. Patient questionnaires included filter questions to differentiate patients who had or had not had surgery. However, surgery was not a selection criterion since our aim was to determine the current state of pain assessment in hospitalized surgical patients, and not all patients hospitalized in surgical departments necessarily undergo surgery.

Table 1 Characteristics of research sample

Sample of nurses (n = 253)			Sample of patients (n = 205)		
Category	**Frequency**	**%**	**Category**	**Frequency**	**%**
Age			**Age**		
18–29 years	65	25.7	15–29 years	27	13.2
30–39 years	73	28.9	30–39 years	54	26.3
40–49 years	73	28.9	40–49 years	45	22
50 years and more	42	16.6	50–59 years	33	16.1
			60–69 years	23	11.2
			70 years and more	23	11.2
The highest education achieved			**Number of hospitalizations in the last year**		
secondary	119	47	1	141	68.8
higher professional	51	20.2	2–3	56	27.3
tertiary – bachelor degree	61	24.1	4–5	7	3.4
tertiary – master degree	22	8.7	6 or more	1	0.5
Length of practical healthcare experience			**Time after the surgery**		
less than 1 year	13	5.1	less than 24 hours	33	16.1
1–2 years	23	9.1	1–2 days	81	39.5
3–6 years	40	15.8	3–5 days	26	12.7
7–15 years	63	24.9	6 and more days	21	10.2
16 and more years	114	45.1	surgery not yet performed	43	21

Data collection

The study was performed between March and the end of April 2019. Two sets of questionnaires were used for the pain assessment of surgical patients in the South Bohemia region. A non-standardized questionnaire was developed for nurses by the research team, based on the literature and the team's own knowledge. The questionnaire's comprehensibility was tested in a pilot study conducted with four nurses working in a surgical unit. The questionnaire was adapted according to feedback from nurses, in cooperation with a statistician. The resulting questionnaire consisted of 31 questions. The questionnaire contained closed questions and semi-closed questions (allowing respondents the opportunity to provide their own answer variants), filter questions, and scale questions. The questionnaire designed for patients hospitalized in the surgical unit comprised a non-standardized section, and the standardized SF-MPQ-2 questionnaire. The non-standardized section of the questionnaire was developed using the relevant literature and the team's own experience. Subsequently, the questionnaire's comprehensibility was tested in a pilot study, conducted with five patients hospitalized in a surgical unit. The questionnaire was adapted according to patient responses, in cooperation with a statistician. The standardized section of the questionnaire contained the SF-MPQ-2 (Short-form McGill Pain Questionnaire – SF-MPQ) questionnaire. Consent to use this tool, and the Czech version of the questionnaire were obtained from the Mapi Research Trust company.

Data analysis

After revision, the obtained data were evaluated using SASD software, version 1.4.10. Frequency tables were developed for individual indicators, and absolute and relative frequencies, modus, median, mean, dispersion, and standard deviation (the first degree of data classification) were calculated. For each feature, the dispersion estimation and standard deviation estimation, the range and the interval estimation for the mean value of 0.05, and the interval estimation of the dispersion of 0.05 were calculated. The second stage of the classification involved the construction of contingency tables, with absolute and relative frequencies. The analysis used (according to feature character and number of observations) Pearson's chi-squared test – X2 (Pearson Chi – Square), and the Independence test at a significance level of $\alpha = 0.05$, $\alpha = 0.01$ $\alpha = 0.001$.k.

Results

From a total of 253 nurses, 197 (77.9%) stated that pain was assessed by doctors in their surgical departments, while all respondents reported that pain was assessed by nurses. Regarding frequency of pain assessment by doctors, the most common responses were that pain was assessed once or twice a day (177/70% of respondents). Sixteen nurses (6.3%) reported a frequency of three or four pain assessments by a doctor per day, and 11 nurses (4.3%) reported a higher frequency (i.e., five or more times). However, 49 nurse respondents (19.4%) stated that doctors did not assess pain in their departments. In contrast, no respondents claimed that nurses had not assessed pain. Pain assessments by

nurses of once or twice a day were reported by 25 respondents (9.9%). Most frequently, pain assessments of five or more times a day were reported (121/47.8%), followed by pain assessments three to four times a day (107/42.3%).

Patients hospitalized at surgical departments were asked several questions relating to the specifics of pain assessment. The results indicate that pain assessments were performed by a doctor for 185 (90%) patients, while pain was assessed by nurses for 195 (95%) respondents, and 34 (17%) reported that pain had been assessed by a physiotherapist. The pain assessment itself was divided into the preoperative period (Table 2) and the postoperative period. The most commonly reported frequency of preoperative assessment by a doctor was once or twice a day, recorded in 114 answers (55.6%), and the same frequency was also most common for assessments by nurses, recorded in 103 answers (50.2%). Nevertheless, in general, the frequency of assessment by nurses was higher than that by doctors. In addition, patients could also report pain assessment by physiotherapists, priests, or other persons. However, most frequently, no other persons, besides doctors and nurses, were reported to have assessed pain preoperatively.

Table 2 Pain assessment after admission to hospital – preoperatively – from a patient perspective (n = 205)

Profession	Assessment frequency							
	No assessment n (%)	1–2x a day n (%)	3–4x a day n (%)	5x or more n (%)	Don't know n (%)	No answer n (%)	mean	SD
doctor	75 (36.6)	114 (55.6)	9 (4.4)	2 (1)	4 (2)	1 (0,5)	1.755	0.753
nurse	35 (17.1)	103 (50.2)	45 (22.0)	12 (5.9)	9 (4.4)	1 (0.5)	2.299	0.967
physiotherapist	174 (84.9)	14 (6.8)	1 (0,5)	0 (0)	15 (7.3)	1 (0.5)	1.373	1.061
priest	186 (90.7)	1 (0,05)	0 (0)	0 (0)	17 (8.3)	1 (0.5)	1.338	1.106
others	185 (90.2)	0 (0)	0 (0)	0 (0)	19 (9.3)	1 (0.5)	1.373	1.163

SD – standard deviation

In the case of postoperative pain assessment, a significant shift was found. The most common frequency of pain assessment by doctors was, again, once or twice a day, reported by 137 patients (66.8%). Only 16 respondents (7.8%) reported that postoperative pain had not been assessed by a doctor. Thirteen patients (6.3%) reported a frequency of the pain assessment by a doctor of three to four times a day. In contrast, for pain assessment by nurses, the most common frequency was three or four times a day, reported by 89 respondents (43.4%). A frequency of five times or more a day was reported by 47 respondents (22.9%). Only 27 patients (13.2%) reported that their pain had been assessed by a nurse only once or twice a day. Postoperative pain assessment by a physiotherapist was reported by 30 patients (14.6%), with pain being assessed once or twice a day. Reports of pain assessment by priests or other persons were negligible.

Both nurses and patients were asked which scale was used by health professionals (doctors and nurses) for pain assessment. The respondents were provided with a list of assessment scales complemented by the option of "others". In the sample of nurses, the option "don't know" was not an available option since it could be assumed that when nurses assessed pain, they knew which scale their assessment was based on. One or more options could be chosen from the list provided. The obtained data (Table 3) suggest that for pain assessment, the visual analog scale (129) and the verbal pain assessment (89) are the most frequently used assessment scales by nurses. For the question focusing on whether the methods of assessment used were adequate, 17.4% of nurses stated that they would appreciate a more precise verbal description, 16.6% would appreciate more frequent pain assessment by doctors, and 9.1% would appreciate the possibility of using a picture to indicate pain. The main manifestations of pain observed by nurses included limited mobility (61.7%), verbal expressions (53%), lack of cooperation (51%), and limited independence (50.6%).

Postoperatively, patients characterized their pain as sharp (49.3%), tiring (22.4%), or dull and persistent (20%). Pain intensity on an analog scale was most frequently rated at 4 (22.4%), 5 (22.4%), or 6 (17.6%). Patients stated that pain was most frequently manifested as emotional instability (45.7%), verbal manifestations (37.2%), and apathy (24.8%). Direct physical manifestations mentioned by patients included limited mobility (84.3%), limited independence (self-sufficiency) (58.4%), and mimic

Table 3 Assessment scales

Scale type	Frequency of nurses' answers (n = 253)	Frequency of patients' answers (n = 205)	
		Used by nurses	Used by doctors
visual analog cale	129	34	23
pain map	12	10	8
verbal assessment	89	58	43
multicolored analog scale	6	3	0
pain assessment records	74	15	8
face scale	32	13	7
no scale used	29	34	52
others	1	0	0
no answer	0	0	0
don't know	x	72	87

x – not applicable to nurses

manifestations (27.7%). Furthermore, patients' responses indicate that, for pain assessment, nurses most frequently used verbal assessment (58), and a visual analog scale (34). According to patients, doctors tended to use verbal pain assessment (43) and a visual analog scale (23). For the question focusing on what could be improved regarding pain assessment, patients mentioned more precision in verbal pain assessment (41%), use of a picture to illustrate the pain (19.5%), and more frequent assessment by doctors (14.1%).

For the study, the correlation between nurses' education and their opinions of the use of pain assessment scales was examined (Table 4). A significant correlation between nurses' education and their opinions on the complementation of pain assessment was observed ($p < 0.01$). Nurses with secondary education significantly more often stated that pain assessments did not need to be complemented. On the other hand, nurses with an academic education (bachelor's degree) significantly more frequently called for a more precise verbal description. No correlations were confirmed with other factors.

Table 4 Correlation between nurses' education and opinions of using assessment scales (n = 253)

Correlation of nurses' education with:	Value X^2	df	p	Significance
frequency of performed assessments	9.501	6	0.147	i.s.
scale used for pain assessment	30.139	21	0.089	i.s.
need to complement pain assessment	38.794	18	< 0.01	**
how pain is assessed	8.445	9	0.490	i.s.
satisfaction with cooperation with doctors during pain assessment	9.869	12	0.630	i.s.

*X^2 – chi-square; p – independence test; df – degrees of freedom; i.s. – insignificant difference; **significant difference for the significance level α = 0.01)*

Like education, the influence of length of practical experience was significant (Table 5). A significant correlation between the length of nurses' experience and frequency of pain assessment was confirmed ($p < 0.001$). Nurses with longer practical experience (three or more years) significantly more frequently reported that they performed pain assessment more times a day. Nurses with one or two years' experience assessed pain three or four times a day. A correlation was also proven between length of experience and opinion of the need to complement pain assessment ($p < 0.001$). Nurses with longer experience (seven years or more) reported significantly more frequently that there was no need to add to pain assessments. No statistical significance was found with other factors.

Table 5 Correlation between length of nurses' experience and opinions of using assessment scales (n = 253)

Correlation between the length of nurses' experience and:	Value X^2	df	p	Significance
Frequency of pain assessment	30.422	8	< 0.001	***
Scale used for pain assessment	27.027	28	0.517	i.s.
Need to complement the pain assessment	56.414	24	< 0.001	***
How pain is assessed	5.921	12	0.920	i.s.
Satisfaction with the cooperation with doctors during pain assessment	25.851	16	0.056	i.s.

*X^2 – chi-square; p – independence test; df – degrees of freedom; i.s. – insignificant difference; ***significant difference for the significance level α = 0.001*

Discussion

Pain is an experience associated with human life. At the same time, it is a very common nursing diagnosis, requiring both appropriate management and an appropriate response on the part of nurses. As Málek et al. (2014) state, a whole multidisciplinary team should be involved in pain assessment and its treatment. The study results indicate that pain assessment was performed by a doctor for 90% of respondents, and by a nurse for 95% of respondents. Only 17% of respondents reported that pain assessment was performed by a physiotherapist. However, cooperation with a physiotherapist can be very beneficial for patients. Greater involvement of physiotherapists in pain management, particularly in the postoperative period, is recommended by Schwellnus et al. (2017), who present data relating to pain management and the role of physiotherapists in treatment following a thoracotomy. Their findings indicate that, although attention is paid to breathing training and early mobilization, the problem of pain and pain alleviation are considered of minor interest. Nevertheless, it should be noted that, before discharge, patients were repeatedly instructed by physiotherapists on expectoration (clearing the throat), exercise, overall physiotherapy, etc., with particular regard to persisting pain. A prospective study by Robarts et al. (2017) draws attention to the involvement of experienced physiotherapists (after specialized professional training) in diagnosing pain in the pelvic spine in order to determine patients needing surgery. Despite generalization in clinical practice, an impetus towards considering the operation of multidisciplinary teams has been observed (Turk et al., 2010). Patient satisfaction must not be overlooked.

Taking into account the aforementioned information, certain contradictions seem to be present in the responses of nurses and patients. Nurses working in surgical units claim to perform pain assessment of patients in 100% of cases, and that pain is also assessed by a doctor in 77.9% of cases, which raises the question of what causes the difference in nurses' and patients' reports. It may be that pain was assessed during a routine conversation with a nurse or a doctor, and patients were, therefore, unaware that pain was being assessed. However, pain may not have been assessed at all. Svensson et al. (2000) also identify differences in assessment of pain by nurses and patients. Their research results indicate that patients sometimes experience a higher pain intensity level than nurses assume to be the case. In addition, they emphasize certain key points which could improve pain management, such as use of quality instruments for evaluation of pain, differentiation of pain assessment at rest and when moving, and more emphasis on an individual approach.

Pain assessment is itself influenced by a number of factors, e.g., whether pain is assessed preoperatively or postoperatively. Pain is assessed less frequently prior to surgery (see Table 2), than postoperatively. According to information obtained from both nurses and patients, visual analog scales and verbal assessment are particularly favored for pain assessment (see Table 3). Again, the responses of nurses and patients indicate a significant discrepancy in the degree of use of particular scales. However, there was agreement between nurses and patients regarding complementation of assessments, with both groups preferring more detailed verbal descriptions, use of pictures to illustrate the pain, and an increase in the frequency of pain assessment by doctors. If the possibilities of available scales for pain assessment are considered (Zemanová & Zoubková, 2012), some of which are tailored to the needs of patients with specific diseases (Mandysová et al., 2017), it poses the question of why they are not used more often in practice, or why they are not used correctly. According to Procházka (2016), if pain is to be accurately assessed, we must have as much information as possible, including knowledge of pain localization, irradiation, and correlation with factors that can increase or relieve pain intensity or character. The differences between acute and chronic pain should also be kept in mind. For this particular assessment, a number of tools adapted to patient needs can be used, such as visual analog scales, pain maps, verbal assessments, multicolored analog scales, face scales, and various kinds of questionnaires and pain assessment records developed for healthcare. The need for continuous education in this area is stressed by Lužný (2013), whose study focuses on pain assessment of patients with dementia. He also draws attention to the issue of inadequately assessed pain, a persistent problem in nursing today. In addition, Plevová et al. (2012) have published a modified pain map that features a picture of a figure on which to indicate pain, as suggested by nurses and patients. In addition, the need for continuous pain monitoring, and early and sufficient pain treatment, which is necessary to overcome the postoperative period successfully, are stressed. Although it focuses on pediatric patients, the article contains information which is also relevant to adults. The need for concise, verified pain assessment tools is mentioned by Hsu et al. (2019), who also draw attention to the importance of tools in assessing the risk of misuse of opiates. Illustrations of concise

verified questionnaires for pain assessment and assessment algorithms can also be found in the WHO's recommendations for pain management in cancer (World Health Organization [WHO], 2018).

The pain manifestations observed by nurses, and manifestations perceived by patients represent another factor directly influencing quality of nursing care. These manifestations – limited mobility, limited self-sufficiency, lack of cooperation, verbal manifestations, and mimic manifestations – relate to the degree of perceived pain and influence the process of recovery and rehabilitation. Bartůněk et al. (2016) emphasize that it is necessary for nursing care to determine the degree of patient immobility and independence in performing everyday activities. According to this assessment, nursing activities should be planned to avoid an increase in perceived pain. However, nurses may happen to forget that pain restricts patient mobility and require patients to do inappropriate things, thus not only increasing pain intensity but also causing mental discomfort. The influence of effective treatments on the successful fulfillment of therapeutic and physiotherapeutic plans is confirmed by Panella et al. (2016), who conducted an open-ended study comparing the effectiveness of treatments applied to 144 patients after knee replacement surgery. The study results confirm that more effective pain reduction can result in better performance of everyday activities.

Pain assessment methods and frequency of assessment clearly correlate with the age, experience and education of surgical nurses. Selected correlations were studied in this area (see Tables 4 and 5). It was confirmed that education influenced nurses' need to complement pain assessment in some way. Nurses with an academic education were more likely to recommend complementation by a more precise verbal description. The influence of nurses' length of practical experience was also proven to be significant, with experienced nurses (three or more years) performing pain assessment more frequently (five times a day or more) than nurses with shorter practical experience. Meanwhile, nurses with the longest practical experience (seven or more years) reported more frequently that it was unnecessary to complement pain assessment.

Conclusion

The data obtained suggest certain shortcomings in pain assessment, of which nurses and patients are aware. Both nurses and patients state that they would appreciate more precise pain evaluation, the option of illustrating pain on a picture, and an increase in the frequency of pain assessment by doctors. Both medical and nursing professionals might be challenged by these findings regarding their provision of care, and, as a result, the quality of patient lives might be improved. Attention is also drawn to the fact that, in spite of the studies performed in the Czech Republic focusing on the utility of pain assessment tools (Mandysová et al., 2017), and the use of the nursing diagnosis of acute pain (Kurucová et al., 2018), the study results are not used effectively in practice. Whether this is caused by the difficulty of introducing unfamiliar activities or changing existing methods, the reluctance of healthcare professionals, problematic organizational structures, or other factors could be the subject of further investigation. Further research could also focus on ways to improve pain assessment and, as a result, the treatment of pain itself.

Ethical aspects and conflict of interest

The authors declare that there were no conflicts of interest, and that the research was conducted according to ethical standards.

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Author contributions

Conception and design (VO, VT, VD), data analysis and interpretation (VO, VD), writing the manuscript (VO, VD), critical revision of the manuscript (VO, VT, VD), finalization of the manuscript (VO).

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