Original Article

Going Beyond the Do-Not-Resuscitate Order: Comparing the Care Received by Cancer Patients with Respect to Hospice Care Needs

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ABSTRACT

Objectives: The purpose of this study is to compare the treatment given to cancer patients in intensive care units (ICUs) who require or do not require hospice care.

Materials and Methods: A descriptive retrospective design was used. A total of 193 files were reviewed for admitted cancer patients.

Results: Individuals requiring hospice care had longer hospital stays (t=1.22, p<.05) and were less likely to be sent to palliative care (X2= 183.5, p<.05). The majority of patients were intubated (72.4%), got intravenous hydration (84.5%), and received antibiotics (81.3%). There was a statistically significant difference in the fluid administration (X2= 1.76, p<.05), antibiotic administration (X2= 1.64, p<.05), and mechanical ventilation (X2= 2.71, p<.05) between individuals who require hospice care and those who do not.

Conclusion: It is necessary to enhance the dialogue between doctors, patients, and caregivers regarding peaceful death and reduce unnecessary treatment.

Keywords: Cancer, Complications, Do-not-resuscitate order, End of life, Healthcare professional, Hospice care, Intensive care unit

INTRODUCTION

Providing hospice care is an essential component of healthcare delivery that needs to be carefully thought through and assessed, especially in the setting of intensive care units (ICUs).[1] Recently, the decisions of initiating or withholding aggressive medical interventions, such as cardiopulmonary resuscitation (CPR), have come under heightened scrutiny.[2] This scrutiny is especially relevant in Jordan, where the dynamics of end-of-life care in the ICU settings, specifically among patients who have chosen to sign a Do-Not-Resuscitate (DNR) order, represent a complex and evolving area of practice.[3,4]

End-of-life care in critical care settings involves complex dynamics, focusing on providing compassionate care that respects the patient's wishes and reduces suffering in their final days.[5] In addition, the historical landscape of end-of-life practices in healthcare settings has witnessed a transformation in recent years, driven by evolving ethical, legal and cultural considerations.[6] Conventionally, aggressive interventions and resuscitative measures were often the default approach, but the global recognition of patient autonomy, as exemplified by the concept of a DNR order, has significantly impacted end-of-life care decision-making (ANA Position Statement, 2020). This historical shift reflects the broader trend in healthcare toward a patient-centred and ethically informed approach to end-of-life care, emphasising patients' rights to make decisions about their care preferences.[7]

In the present study, patients with DNR were included since the DNR order is often at advanced stages of their disease and may be nearing end-of-life, making them a relevant population for studying the appropriateness and effectiveness of hospice care.[8] In addition, hospice care is primarily focused on comfort and quality of life for patients who are no longer pursuing curative treatments.[9] DNR orders reflect a decision to forego aggressive life-prolonging measures, aligning closely with the philosophy of hospice care. In the same line with these developments, healthcare professionals' knowledge, attitudes and practices concerning DNR

orders and end-of-life care have evolved.[10] It is crucial to acknowledge that these changes in practice have substantial implications for healthcare outcomes, including the quality of life in patients near the end of life.[3,11] A complex interaction of cultural, ethical and clinical elements characterises the current state of end-of-life practices in Jordanian ICUs.[3,12] As the prevalence of DNR orders rises, it becomes increasingly important to investigate the attributes of ICU practices regarding end-of-life care in Jordan, shedding light on the factors influencing healthcare professionals' decision-making processes.[13,14] Moreover, considering the diverse and dynamic nature of the healthcare system, identifying current practices can contribute to a broader international discourse on ethical and cultural dimensions of end-of-life care.[15]

When deciding whether to switch a cancer patient from active treatment to hospice care, there are many more intricate assessments and factors to take into account than just whether a DNR order is present. This change is significant because it represents a move in the emphasis of care from curative to palliative, intending to enhance the patient's and their family's quality of life.[16] Several key aspects should be taken into consideration when evaluating the need for hospice care versus care received by cancer patients. For instance, sometimes discussing more general end-of-life care preferences, such as the possible switch to hospice care, might be sparked by the existence of a DNR order.[17] In addition, hospice care is generally considered when a patient's disease is advanced and no longer responds to curative treatments that are often determined by specific medical criteria related to cancer progression.[18]

Despite the significant importance of this topic, there is a noticeable gap in the research literature concerning the attributes of ICU practices at the end of life among patients with DNR orders.[19,20] While international studies have explored end-of-life practices and DNR decisions, there is a recognised need for further studies that examine specific contexts, including Jordan. Addressing this gap is essential to inform healthcare policies, improve patient care experiences and ensure that end-of-life decisions align with patients' values and preferences. Hence, this study aims to compare the treatment given to cancer patients in ICUs who require hospice 'versus those' who do not require hospice care.

MATERIALS AND METHODS

Design

A descriptive retrospective design was used.

Settings and sample

This study was conducted at two (public and non-profit) centres located in the capital of Jordan. These centres have specialised cancer centres in the Middle East and offer treatment for all cancer patients. In each centre, there are ICUs specified for cancer patients with a capacity of beds ranging from 30 to 50 beds. The inclusion criteria were (1) any patient admitted to the ICU, (2) diagnosed with advanced cancer stage (4, or metastatic), (3) and signed the DNR form. The sample size was calculated using G*power for the Chi-square test with a medium effect size of 0.3, $\alpha = 0.05$, and β value of 0.8.[21] The estimated sample size is 143 participants. However, to overcome the problem of decreased response rate and attrition rate, the distribution of 200 questionnaires was increased. Out of 240 distributed surveys, 193 were considered for the final analysis with a response rate of 80.4%.

Outcome measures

A self-developed survey was utilised to collect data. Survey items are derived from validated tools and frameworks including Acute Physiology and Chronic Health Evaluation II (APACHE II), the expected mortality rate (EMR) and the Palliative Performance Scale (PPS) because they have been rigorously tested and widely accepted in clinical research. Furthermore, a comprehensive review of existing studies and validated tools ensures that the survey includes items reflecting the core aspects of ICU care, palliative needs and patient outcomes. The developed survey was piloted in the same settings among 50 patients. The survey items were adopted from updated literature. The pilot study was performed to validate the survey, which revealed a good reliability index (Cronbach Alpha) = 0.89. The authors established this survey based on the previous literature that discusses the practice among patients who reach the end-of-life stage. Items are modified to align with cultural norms, beliefs and healthcare practices in the region. The survey includes three sections: patient-related clinical data and ICU care interventions and complications. The demographic data include age, sex, nationality, insurance, marital status and death year. The patient-related clinical data include cancer type and stage, admission/referral place, admission reason, comorbidities, length of stay, APACHE II, the EMR and PPS. APACHE II is an ICU scoring system for adult patients to measure disease severity. The score ranged from 0 to 71 based on several parameters, while the higher score indicates a high mortality risk. The PPS is a tool that assesses the prognosis of seriously ill patients and has been used in various studies.[22] In these studies, a score of 70 or lower was indicative of hospice care eligibility, while a score higher than 70% was not eligible for hospice care (Weng *et al.*, 2009).[23]

The last section included questions about the ICU care interventions and complications during the last ICU admission, such as receiving mechanical ventilators, surgical interventions, vasoactive drugs, antibiotic medications, enteral feeding, dialysis, intravenous fluid and blood transfusion, and developed complications during the last ICU hospitalization. All questions in this section were answered either by 'Yes' with a score of '1' or 'No' with a score of '0'.

Data collection procedure

Death registration and hospital records for cancer patients who died in the ICU between the years 2019 and 2022 at a main regional cancer centre in Jordan were reviewed. Data mining was used to collect information related to the patient's demographic and clinical data. All patient records were retrieved from electronic health records at the hospital's information technology centre. The first researcher obtained approval from the head of the department to use the available computer after explaining the study's aim, significance and benefits. The maximum time needed to complete each questionnaire was 10 min. Data were collected from the period of December 2019 to June 2023. The Institutional Review Board (IRB) at the Al-Zaytoonah University of Jordan has approved this study (Ref. # 26/4/2022 SON). Besides, the IRB of the study's cancer centre was approved with a reference number of (Ref. #13 KHCC 76) following the Declaration of Helsinki. The requirement to obtain informed consent was waived due to the retrospective nature of the study. All data were confidential and the approval from the selected hospital was granted.

Statistical analysis

The Statistical Package for the Social Science version 28 was used to analyse the data. Descriptive statistics were used to analyse the demographic, clinical data and common interventions in the ICU. For categorical variables, the number and percentage distribution by category were calculated. For continuous data, mean (M) and standard deviation (SD) were used. The Chi-square test was used to assess the difference in frequencies between those who need hospice care and those who do not need hospice care based on sociodemographic and clinical data. A binary system makes it straightforward to classify data, reducing ambiguity in identifying whether a particular intervention or complication occurred. Besides, recording a 'yes' or 'no' for each intervention or complication is quicker and less prone to error compared to more complex scoring systems, especially in large datasets. Logistic binary regression was used to predict the factors associated with susceptibility to hospice care or not.

RESULTS

Characteristics of the sample

A total of 193 questionnaires were included in this study with a mean age of M = 57.4 ± 15.2. Most participants were married (n = 138, 71.5%) and had governmental insurance (n = 184, 95.3%). The majority of patients were diagnosed with solid cancer (n = 165, 85.5%). One hundred and eighty-eight of the patients had metastatic cancer (67.9%) and 179 patients reached the 4th stage and terminal stage of cancer (n = 179, 92.8%). Most patients were married (n = 118, 85.5%), had comorbidities (n = 97, 89.8%), diagnosed with solid (n = 144, 87.3%) and had metastatic cancer (n = 166, 88.3%). However, there is no significant difference between those who need hospice care and those who do not in terms of their sociodemographic data [Table 1].

Patient-related clinical data

The mean length of stay in the hospital was (M = 8.41 ± SD = 14.7), and in ICU was (M = 7.78 ±SD= 9.97). The APACHE score reflected the estimates of ICU mortality with a mean of 34.3 (SD = 29.4), and the mean of the expected mortality rate was 56.7 (SD = 27.1). A little over 34.2% of participants had readmitted to the ICU during their current hospitalisation (n = 66). Of the participants who signed the DNR order but received CPR at the time of death were 16 (8.3%). Most of those who need hospice care have more hospital (M = 8.89, SD = 15.4), ICU length of stay (M = 8.01, SD = 9.96), admitted for the first time to ICUs (n = 111, 65.3%) and did not receive referral to palliative care services (n = 170, 99.4%). A significant difference was found between those who needed hospice care or not in terms of length of hospital stay (t = 1.22, $P < 0.05$), and referral to palliative care (χ^2 = 183.5, $P < 0.05$). Those who required hospice care were referred to palliative care services and stayed in the hospital for a longer time than patients who did not need hospice care [Table 2].

ICU care interventions

Until the last hours of life, most patients received intravenous fluid administration (n = 163, 84.5%) and antibiotics (n = 157, 81.3%). There is a significant difference between those who needed hospice care and those who did not regarding the fluid administration (χ^2 = 1.76, $P < 0.05$) and receiving antibiotics (χ^2 = 1.64, $P < 0.05$). Further, more than two-thirds of participants were connected to a mechanical ventilator (n = 138, 71.4%), received consultation (medical and/or surgical) (n = 136, 70.5%) and surgical intervention was implemented (n = 134, 69.4%). Hospice care was significantly associated with receiving a mechanical ventilator (χ^2 = 1.64, $P < 0.05$), requesting medical/surgical consultation (χ^2 = 1.64, $P < 0.05$) and performing surgical intervention (χ^2 = 1.64, $P < 0.05$) as compared to individuals who do not require hospice care. Despite that more than half of patients received vasoactive medications until their death (n = 101, 52.3%), no significant difference was found between those who needed hospice care and not [Table 3].

Complications developed in the last ICU admission

Most of the participants developed skin complications, such as pressure injuries and peripheral oedema (n = 154, 79.8%), as well as fluid and electrolyte complications (n = 145, 75.1%) and respiratory complications, such as respiratory congestion (n = 145, 75.1%). More than three quadrants of the patients (n = 128, 66.3%) developed sepsis as a complication during their hospitalisation. Neurological complications accounted

Table 1: Sociodemographic data (*n*=193).

Variables	*n* (%)	Did not require hospice care	Require hospice care	Statistics
Age				
M±SD (57.4±15.2)		57.4 (14.9)	58.4 (15.7)	−0.3151
Gender				
Male	98 (50.8)	12 (52.2)	86 (87.8)	0.0212
Female	95 (49.2)	11 (47.8)	84 (88.4)	
Marital status				
Not married	55 (28.5)	3 (5.5)	52 (94.5)	3.062
Married	138 (71.5)	20 (14.5)	118 (85.5)	
Comorbidities				
Yes	108 (56)	11 (10.2)	97 (89.8)	0.7012
No	85 (44)	12 (14.1)	73 (85.9)	
Insurance				
Governmental institutions	184 (95.3)	22 (12)	162 (88)	0.0162
Private/self-paying	9 (4.7)	1 (11.1)	8 (88.9)	
Cancer type				
Solid	165 (85.5)	21 (12.7)	144 (87.3)	0.7112
Haematology	28 (14.5)	2 (7.1)	26 (92.9)	
Cancer stage				
1–3rd	14 (7.2)	0	14 (100)	2.0622
4th	88 (45.6)	11 (12.5)	77 (87.5)	
Terminal stage	91 (47.2)	12 (13.2)	79 (86.8)	
Presence of metastasis				
Yes	188 (67.9)	22 (11.7)	166 (88.3)	0.3192
No	5 (32.1)	1 (20)	4 (80)	

[2]Chi-square test, M: Mean, SD: Standard deviation, n: Number, %: Frequency

Table 2: Compare participants' clinical data based on the need for hospice care (*n*=193).

Variables	Mean±SD	*n* (%)	Did not require hospice care (*n*=23)	Require hospice care (*n*=170)	Statistics
Hospital length of stay	8.41 (14.7)		4.91 (7.22)	8.89 (15.4)	1.216[*1]
ICU length of stay	7.78 (9.97)		6.09 (10.1)	8.01 (9.96)	0.859[1]
APACHE II score	34.3 (24.9)		26.8 (6.32)	25.3 (7.63)	−0.866[1]
Expected Mortality rate	56.7 (27.1)		52.4 (21.3)	50.1 (23.5)	−0.429[1]
First-time admission to ICU					
Yes		127 (65.8)	16 (69.6)	111 (65.3)	0.164[2]
No		66 (34.2)	7 (30.4)	59 (34.7)	
Received CPR previously					
Yes		16 (8.30)	3 (13)	13 (7.6)	0.776[2]
No		177 (91.7)	20 (87)	157 (92.4)	
Referral to palliative care					
Yes		22 (11.4)	22 (95.7)	0	183.5[*2]
No		171 (88.6)	1 (0.6)	170 (99.4)	

[1]Independent t-test, [2]Chi-square test, *P<0.05, M: Mean, SD: Standard deviation, *n*: Number, %: Frequency. ICU: Intensive care unit, CPR: Cardiopulmonary resuscitation, APACHE II: Acute Physiology and Chronic Health Evaluation II

for (n = 90, 53.4%) of patients and cardiac complications (n = 75, 38.9%). Few patients have haematological (n = 38, 19.7%) and musculoskeletal (n = 57, 29.5%) complications [Table 3]. In terms of developing neurological complications (χ^2 = 1.09, P < 0.05), fluid and electrolyte complications (χ^2 = 1.43, P < 0.05), skin complications (χ^2 = 1.28, P < 0.05), cardiac complications (χ^2 = 8.73, P < 0.05) and respiratory complications (χ^2 = 8.73, P < 0.05), there was a significant correlation between patients who required hospice care and those who did not.

DISCUSSION

Making the DNR choice at the end of life is crucial.[23] It is deemed necessary that patients are provided with information on the terminal nature of their illness, their alternatives for end-of-life care and the chance to make these decisions on their own.[6] This study highlights the attributes of ICU practices among cancer patients whose families approved DNR orders. It was shown that most patients had an average age of 57 years old, married, diagnosed with solid tumours in their 4th stage of cancer. These findings were consistent with a study that was performed by Ouyang *et al.*,[6] who stated that most patients die at 65 years of age, with an advanced stage of metastatic level of disease at their end-of-life care.

Based on the clinical data of patients who were admitted to the ICU, it was shown that most patients who had a DNR order had more length of stay in the hospital. This finding is in the same line as a study that was conducted by Swor *et al.*,[24] for stroke patients who had an order of DNR and had a length stay of about 9.5 days. This result highlights an intricate correlation between DNR orders and length of stay that is contingent on in-hospital mortality, the DNR order's timing and the severity of the patient's disease on admission. Furthermore, the present study shows that the APACHE score reflected a higher mortality expectation in the ICU. This is consistent with a retrospective study that was performed by Kuo *et al.*,[25] among cancer and sepsis patients. Concluding that for critically ill patients with cancer and sepsis, the APACHE II score and the cancer control status may be predictive indicators that could be useful in assessing end-of-life treatment.

A small number of patients who had a Do-Not-Resuscitate (DNR) order in place still received cardiopulmonary resuscitation (CPR) at the time of death in this study, suggesting potential issues with adherence to advance directives or communication gaps in end-of-life care. Consistent discordant was found in another study that was conducted by Robbins *et al.*,[26] who reported that 9% with a full code status died without receiving CPR; these patients' deaths were linked to higher APACHE scores, primary neurologic or trauma diagnoses and admissions that occurred within the last year. This finding could be attributed to the abrupt alteration in real time due to the following reasons; contemporaneous clinical assessment,

not the envisaged circumstances and temporary suspension. Depending on the primary admission diagnosis, these factors of contextual changes in code status could account for some of the variations in CPR concordance observed in this study. Unnecessary interventions were provided to end-of-life patients' care in this study, such as administration of intravenous fluid, antibiotics, enteral or parenteral feeding, surgical interventions and medical consultations. These results were in the same line as a systematic review study performed by Cardona-Morrell *et al.*[27] that includes 38 studies, indicating that 33–38% of patients close to the end of their lives, on average, received non-useful treatments. Besides, it was reported that there were several active management such as dialysis, radiation, antibiotic administration, intravenous fluid and blood administration with an average of 7–77% for the terminally ill patients with no beneficial treatment. It was expressed that these treatments and interventions as less frequently employed and also described as unneeded hospital stays, emergency services and rapid response systems, as well as the high cost of ICU care and treatment duration.

Furthermore, it was reported that many patients had several complications namely, skin, fluid and electrolyte imbalances and respiratory complications, respectively. These findings were consistent with a study finding that was performed by Claure-Del Granado and Mehta[28] who reported that in terminally ill patients, complications such as skin issues, fluid and electrolyte imbalances and respiratory complications are common due to the progressive decline in bodily functions. Furthermore, a survival analysis showed that the following conditions were linked to a lower chance of survival including upper gastrointestinal bleeding, peritonitis, delirium, pneumonia and metabolic acidosis. These findings could be related to high staff: patient ratio, poor prognosis among cancer care and lack of assistance from family and caregivers, which lead to higher complications of skin complication including pressure ulcers, and poor healing, followed by inappropriate administration of fluid that leads to disturb the function of fluid and electrolytes, and respiratory problems due to great dependency on utilising mechanical ventilation, poor management of using ventilators device appropriately.

A certain amount of non-useful treatments and interventions seems to always be present, but this does not mean that their prevalence should not be decreased. This is due to the uncertainty of the prognosis regarding the time to death, the social, ethical and cultural pressures and the compassionate recommendation for trial ICU admissions while families come to terms with the inevitable.

Healthcare decisions in Jordan are significantly influenced by cultural and religious views. Enhancing end-of-life care and decision-making processes requires healthcare professionals to recognise and honour these beliefs while offering families evidence-based advice.

Table 3: Compare interventions and complications during the last few days in intensive care units based on the need for hospice care.

Interventions	N (%)	Did not require hospice care (n=23)	Require hospice care (n=170)	χ²
Blood transfusion				
Yes	2 (1)	0	2 (1.2)	0.273
No	191 (99)	23 (100)	168 (98.8)	
Intravenous fluid administration				
Yes	163 (84.5)	18 (78.3)	145 (85.3)	1.76*
No	30 (15.5)	5 (21.7)	25 (14.7)	
Antibiotic administration				
Yes	157 (81.3)	18 (78.3)	139 (81.8)	1.64*
No	36 (18.7)	5 (21.7)	31 (18.2)	
Enteral/parenteral feeding				
Yes	35 (33.7)	3 (13)	32 (18.8)	1.74
No	150 (66.3)	20 (87)	130 (76.5)	
Mechanical ventilation				
Yes	138 (72.4)	15 (65.2)	123 (72.4)	2.71*
No	54 (28)	8 (34.8)	47 (27.6)	
Renal dialysis				
Yes	7 (3.6)	1 (4.3)	6 (3.5)	0.631
No	185 (95.9)	22 (95.7)	164 (95.7)	
Vasoactive medication administration				
Yes	101 (52.3)	12 (52.2)	89 (52.4)	0.527
No	92 (47.7)	11 (47.8)	81 (47.6)	
Surgical interventions				
Yes	134 (69.4)	8 (34.8)	51 (30)	20.7*
No	59 (30.6)	15 (65.2)	119 (70)	
Medical/surgical consultation				
Yes	136 (70.5)	22 (95.7)	0	63.1*
No	57 (29.5)	1 (4.3)	170 (100)	
Complications				
Neurological complications				1.09*
Yes	90 (46.6)	10 (43.5)	80 (47.1)	
No	103 (53.4)	13 (56.5)	90 (52.9)	
Renal complications				1.55
Yes	82 (42.5)	7 (30.4)	75 (44.1)	
No	111 (57.5)	16 (69.6)	95 (55.9)	
Fluid and electrolyte complications				1.43*
Yes	145 (75.1)	16 (69.6)	129 (75.9)	
No	48 (24.9)	7 (30.4)	41 (24.1)	
Skin complications				1.28*
Yes	154 (79.8)	19 (82.6)	135 (79.4)	
No	39 (20.2)	4 (17.4)	35 (20.6)	
Cardiac complications				2.78*
Yes	75 (38.9)	7 (30.4)	68 (40)	
No	118 (61.1)	16 (69.6)	102 (60)	

(*Contd...*)

Table 3: (*Continued*).

Interventions	N (%)	Did not require hospice care (*n*=23)	Require hospice care (*n*=170)	χ²
Respiratory complications				8.73*
Yes	145 (75.1)	17 (73.9)	128 (75.3)	
No	48 (24.9)	6 (26.1)	42 (24.7)	
Sepsis complications				0.648
Yes	128 (66.3)	16 (69.6)	112 (65.9)	
No	65 (33.7)	7 (50.4)	58 (34.1)	
Gastrointestinal complications				0.513
Yes	79 (40.9)	11 (47.8)	68 (40)	
No	114 (59.1)	12 (52.2)	102 (60)	
Musculoskeletal complications				0.252
Yes	57 (29.5)	7 (30.4)	50 (29.4)	
No	136 (70.5)	16 (69.6)	120 (70.6)	
Haematology complications				0.729
Yes	38 (19.7)	3 (13)	35 (20.6)	
No	155 (80.3)	20 (87)	135 (79.4)	

χ²: Chi-square test, *$P<0.05$, M: Mean, SD: Standard deviation, *n*: Number, %: Frequency

To summarise, thorough evaluations of physical, psychological and social aspects are required to proceed beyond the DNR order when determining whether hospice care is necessary. By matching care to the patient's values and desires, this procedure seeks to provide comfort and dignity during the last stages of life. It involves creating an atmosphere in which end-of-life care recipients and their families feel empowered to make decisions that are in line with their preferences and objectives.

Strengths and limitations

There were various restrictions on this study. Initially, electronic data were obtained from health information systems from two healthcare facilities. As a result, the study's findings might only apply to hospitals with comparable resources. Second, the database did not contain information about the socioeconomic status of the patients (such as their marital status, degree of education, place of residence and economic standing). As a result, it was difficult to assess the relationships between DNR orders, hospice care utilisation rates and socioeconomic level. Third, the analyses only included information about terminal patients who passed away in hospitals; information about deceased individuals who passed away at home, or somewhere else was excluded from the study. However, this is the first study to compare DNR order and hospice care utilisation rates for terminal-ill patients in Jordan.

CONCLUSION

This study emphasises how crucial it is to specifically consider factors when assessing how DNR orders affect hospital care costs, including stage of disease, type of care and

effectiveness of treatment. Confirmation of non-beneficial treatment was found in end-of-life care among cancer patient in their terminal stages. Reaching that cancer patients who were nearing the end of their lives and the people who cared for them revealed contradictory wishes to live longer and die quietly. It is necessary to enhance the dialogue between doctors, patients and caregivers regarding peaceful death and reduce the unnecessary treatment that could lead to refractory complications.

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