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Terapie intensive aperte: abbiamo ancora dubbi?

Silvia Scelsi

Presidente ANIARTI

Riceviamo diversi lavori di colleghi su questo tema, e abbiamo contribuito a scriverne altrettanti.

È un tema che ci è caro da molti anni direi circa venti. Ma cosa sono le terapie intensive aperte?

Le terapie intensive aperte sono un modello assistenziale in cui i reparti di terapia intensiva consentono un accesso più flessibile ai familiari dei pazienti, promuovendo un approccio più umano e centrato sulla persona. Questo modello si contrappone alla tradizionale rigidità degli orari di visita nelle terapie intensive chiuse. Le caratteristiche principali delle terapie intensive aperte sono le seguenti: i) accesso più ampio ai familiari: orari di visita prolungati o addirittura h24, compatibilmente con le condizioni del paziente e le esigenze di assistenza; ii) coinvolgimento della famiglia: i caregiver vengono informati e, laddove possibile, coinvolti nell'assistenza del paziente; iii) riduzione dello stress per i pazienti: la presenza dei familiari può ridurre l'ansia, la confusione e la sensazione di isolamento ed anche i fenomeni di delirio; iv) miglioramento della comunicazione equipe-paziente-famiglia: maggiore efficacia della comunicazione e collaborazione tra il personale sanitario e i familiari; v) possibile riduzione della durata della degenza: alcuni studi suggeriscono che il supporto affettivo possa favorire il recupero della persona assistita; vi) maggiore accettazione del lutto da parte dei familiari in un processo che li aiuta ad attraversarne le diverse fasi; vii) minore incidenza dei contenziosi, in quanto le persone si rendono conto di quanto accade e non vengono lasciate dietro una porta chiusa ad immaginare l'impossibile.

Certo è che l'arrivo del COVID non ci ha aiutato nel processo intrapreso dai professionisti per dare una risposta concreta ad un bisogno della persona e dei famigliari di presa in carico globale in un momento della vita molto particolare e critico da diversi punti di vista.

Ha comportato una nuova spinta all'isolamento che chiaramente ha riportato indietro anni di lavoro per una nuova cultura.

Bisogna però dire che le comunità professionali attraverso le società scientifiche si sono impegnate per cercare di riportare il bisogno della persona al centro, ad esempio attraverso il percorso del "Comunicovid", progetto che ha implementato strumenti operativi per aprire virtualmente le terapie intensive in un momento in cui il contatto umano era pericoloso.

Inoltre, in Italia per quanto siano stati prodotti diversi statement, compreso il parere autorevole del Comitato Nazionale di Bioetica, nonostante le maggiori società scientifiche (SIAARTI e ANIARTI) si siano pronunciate più volte a favore, non solo con la produzione di articoli, ma con l'implementazione di percorsi di formazione e di progetti come "Intensiva.it", fino a cercare di proporre un disegno di legge per l'apertura delle terapie intensive la percentuale di terapie intensive aperte in Italia è decisamente bassa, non supera il 2% (A.C. 141,25 ottobre 2017) contro il 70% della Svezia. Sicuramente la sfida sta nella necessità di bilanciare l'apertura con la sicurezza del paziente, la gestione delle infezioni e il carico di lavoro del personale, ma è altrettanto vero che la domanda cruciale rimane quella che in un percorso di formazione fatto da ANIARTI nel biennio 2012-2014 con eventi in tutta Italia, con la collaborazione di diversi professionisti e pazienti che portavano la testimonianza del vissuto di una terapia intensiva aperta, abbiamo deciso di proporre agli oltre 400 infermieri con un questionario in cui era contenuta ed era la seguente: "se tu avessi un tuo caro in terapia intensiva vorresti che fosse aperta?"

La risposta è ovvia, tutti hanno risposto "sì". Il cambio di prospettiva da operatore a paziente inverte le priorità e ci permette di ragionare con più attenzione su cosa è necessario.

Continueremo come società scientifica ad implementare le evidenze e a cercare le ragioni obiettive dei vantaggi ci cui abbiamo brevemente accennato, ma vi lascio con una domanda, parafrasando Gabba quando parlava di simulazione avanzata: abbiamo davvero bisogno di evidenze per rendere umana la nostra assistenza?

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Parole chiave:terapie intensive; terapie intensive aperte; assistenza.

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From ICU to "I SEE YOU": Introducing the family member in COVID-ICU

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The death rates in Intensive Care Units (ICU) caused by COVID-19 were 37.3%,[1] creating traumatic outcomes in family members forced to detach from their relative, in their homes.[2]

Patient and Family Engagement in ICU has been defined as: "an active partnership between health professionals and patients and families working at every level of the healthcare system to improve health and the quality, safety, and delivery of healthcare."[3] Involving family members in a pandemic era in COVID-ICUs was a complex challenge, as a balance had to be struck between the five ethical principles of Family Centred Care's (FCC)[4] and the safety of visitors and patients[5] and thed increased burden of care of health professionals who worked in the COVID-ICUs[6] which were to contain the fear of family members[7] and support the family member to perform advanced activities such as donning/doffing of Personal Protective Equipment (PPE).[8]

According to a recent concept analysis, family involvement in high isolation in the ICU is a sensitive balance of several variables (education and information transfer; team collaboration; delegation of responsibility to the family; decision making; and protection of the family) that are determined by a triangular interaction between patient, family and nurse conditions.[9]

Following the ethical fundamentals of FCC[4] and the desire that emerged from family members in being close to their loved one hospitalized in COVID-ICUs,[10] a FCC Hospital for COVID-ICU project was introduced in Italy in January 2021. In fact, it has been highlighted in the literature how family members are the centre of care in ICU,[11] both in their active participation in ICU, their role in communication, sharing choices and making clinical decisions with health professionals,[12] as well as in the environmental role of bringing back daily figures in an alienating environment such as ICU 13. Results resulted in important outcomes such as reduction of depression, PTSD and anxiety stay in ICU and improvement quality of life of patients and family members.[13]

The restriction on ICU visitation policies harmed and fueled Post Intensive Care Syndrome-Family (PICS-F),[14] demolished years of research that conferred how important is the support of family members at the end of life and during intensive care,[15,16] an extremely important stage for grieving,[17,18] it has also been found to be critical in reducing long-term effects such as psychological, physical, cognitive, and social problems of family members subjected to traumatic separations due to hospitalization in ICUs[19]during the pandemic.[20] With a qualitative study,[21] the need of family members who have experienced separation and estrangement of their family member from home was analyzed, the results identified that fear, detachment, life on standby, family-related loneliness in the COVID-ICU and an unexpected event characterized the lived experience. In a second step, an instrument was developed to assess satisfaction with the training of family members on the donning/doffing of PPE, to reduce barriers due to lack of knowledge of the disease and lack of preparation for an extremely complex high isolation dressing, stating that the instrument was found to be reliable and valid for this procedure.[8] In the final instance, the lived experience of relatives who had contact with their relative with COVID in the ICU was investigated with a phenomenological study;[7] after a period of detachment from admission and showed that fear of contagion related to donning/doffing procedures, positive emotions related to first contact with the hospitalized relative, concern for the emotional state of the hospitalized relative, impact of the COVID-ICU and comparisons between imagination and reality regarding the severity of the disease, and recognition of and gratitude toward healthcare professionals char-

Figure 1. The triadic effects of policy on ICU visits.

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acterized the phenomenon of entry into the COVID-ICUs.

The project of integrating family members into high isolation ICUs was lengthy and gave nurses a way to reduce a devastating burden of loneliness of which the patient was the victim and nurses represented the unknown family members.

Detachment, life on standby, restriction to visits, precautionary isolation, loneliness, sense of worthlessness, virtually shared decisions, end of life unsupported by family members, and mandatory use of PPE caused a direct emotional burden on the patient and an indirect emotional burden on family members and nurses creating a triangular emotional effect on the three protagonists of direct and indirect care in ICU. This policy path on visits has allowed people to desire contact with their loved one to see and touch them directly, even if with layers of protective tissues. It will be crucial for future studies to apply the data from these studies to centralize care in family members of relatives admitted to ICUs even in pandemic situations or those requiring preventive detachment (for diseases with high contagiousness), so as to confer humanization of care even in extreme situations. The pandemic era should not be a history book but a page of the present, following the principle of FCCs in ICUs, it is appropriate to guide care in a triadic direction so as to reduce the incidence of PICS and PICS-F and improve the nursing workload in ICUs (Figure 1).

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Perception and attitudes of critical care nurses on external urinary catheter securement and the prevalence of securement devices in critically ill patients

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ABSTRACT

Introduction: the literature describes the limited use of urinary catheter securement devices (UC). Critical care nurses (CCNs) consider UC security an important activity for nursing care. Our objective was to determine CCN perceptions and attitudes to external UC security and the prevalence of securement devices in seriously ill patients.

Materials and Methods: a cross-sectional observation study was carried out between the CCNs of southern Italy between May and July 2023. All CCNs with a probationary period of less than six months were excluded. Chi-square tests assessed the correlation between variables. The significance level was set to p> 0.05.

Results: a total of 77.6% (n=76) know UC securement devices, but only 43.9% (n=43) have these devices available in operational units. CCNs with security devices reported reduced urinary tract infections [(89.5% n=42) compared to (10.6% n=5), p=0.007] and patient comfort [(83%, n=60) versus (16.7%, n=12), p=0.02] and dislocation [(84.9%, n=62) versus (15.1%, n=11)]. Changes can be reduced according to CCNs with safety devices [56.2% (n=41) versus 43.8% (n=32), p=0.0001].

Conclusions: the results of this study will significantly contribute to incorporating this activity into standard nursing care and improving the quality of care. Future research should consider the potential effects of nursing care.

Key words: Urinary catheters, attitude, perception, critical care nurses, securement device.

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Introduction

The Urinary Catheter (UC) is the most used indwelling invasive device in hospitalized patients, with 17.5% of patients in 66 European hospitals[1] and 23.6% in 183 U.S. hospitals[2]. Despite widespread use, these devices are not free from adverse events.[1,2] Several studies showed that urinary catheterization can cause severe mechanical trauma (perforation, partial urethral damage, and urinary leakage), symptomatic bacterial infection, anaphylaxis, catheter toxicity, hypersensitivity,[3] dislocation, and pressure ulcers.[4-7]

The literature describes the effectiveness of adhesive securement devices for vascular catheters, reporting interesting and innovative results,[8] but their effectiveness on urinary catheterization is often overlooked.[9] Recently, a literature review has shown encouraging results regarding external UC securement.[10] The studies included in the review reported a reduction in adverse events such as i) infection, ii) device dislocation, and iii) urethral meatus erosion while highlighting an improvement in iv) patient comfort,[10] thanks to the use of appropriate external securement systems such as containment straps and StatLock® and GripLock® adhesive systems.[11,12] In research by Tracy and colleagues in 2000, the effectiveness of adhesive securement systems compared to traditional methods such as safety pins and adhesive tape was evaluated.[13] The UCs of patients secured with adhesive securement systems did not remain in place for less time compared to urinary catheters of patients with UCs secured with adhesive tape or safety pin. The authors conclude that the sample is too small to be generalized, but the initial results show a significant area of interest for urinary catheter securement. A similar study was conducted by Macneil and colleagues, which, comparing the data of the force exerted by the UC on the bladder neck,[14] highlighted the apparent reduction of such force using external securement devices. Even UC-related infection can be reduced thanks to using such devices, as demonstrated by Darouiche,[15] with a 45% reduced infection rate on a sample having the UC secured with a StatLock® device. Appah and colleagues have shown that only 18% of catheterized patients in the hospital structure under study have the correct UC securement device,[16] demonstrating how this nursing practice is not widely implemented. The study by Orme and colleagues in 2008[17] analyzes three clinical cases intending to evaluate the effectiveness of the adhesive securement device for indwelling urinary catheters. The results show that standard tape did not ensure the necessary securement; the adhesive system with plastic housing proved cumbersome, difficult to remove, and uncomfortable for the patient. Securement straps ensure proper fixation but often slip and rub, leaving marks on the thigh. On the other hand, the hydrocolloid-based system proved easy to apply and ensured excellent device stability. Although external securement devices are designed to promote device stability, accidental catheter dislocation was, and still is today, a problem encountered by many patients.[18-21] The existing literature suggests that UCs should be adequately secured to increase device stability and reduce adverse events.[22-25] Critical care nurses consider external UC securement an essential aspect of care, but this perception does not align with current practice.[9] Moreover, the available literature on the subject is still insufficient, mainly due to the limited number of studies conducted in the international field.[10] Future research should also be oriented toward UC securement systems to make this invasive but essential device safer.[8-10] Currently, critical care nurses are still not highly inclined to promote the use of UC securement devices, even though their implementation would undoubtedly improve the standards of care for critically ill patients admitted to the Intensive Care Unit (ICU). The results of this study aim to understand the barriers that hinder the correct use of external UC securement in critically ill patients to include this practice as a standard of care. We hypothesize that external UC securement systems are rarely used, and critical care nurses do not consider this practice essential in the care process of critically ill patients. Therefore, this study aims to investigate the perception and attitudes of critical care nurses on external UC securement and the prevalence of securement devices in critically ill patients admitted to ICU.

Materials and Methods

Study design and research question

A cross-sectional observational study was conducted among critical care nurses. The question that guided our study is: What is the prevalence of external urinary catheter securement systems? Moreover, what are the perceptions and attitudes of critical care nurses on the effectiveness of these devices?

Data collection and participants

Data were collected between May 25, 2023, and July 31, 2023, through a free platform for creating surveys, "Google Forms". Through the local representatives of Southern Italy of the National Association of Critical Care Nurses (ANIARTI), an ad hoc constructed questionnaire was distributed. The study's first phase included identifying representatives who were available to participate. Participation was voluntary. Once the available representatives were identified, they were asked to disseminate the questionnaire link among their work colleagues. All critical care nurses who expressed consent to participate in the study were enrolled after adhering to the information notice of both sexes. All critical care nurses with less than 6 months of service in the probationary period were excluded. Subsequently, the data obtained were imported into the Excel worksheet for data analysis.

Instrument

An ad hoc tool was created for data collection. The first part of the instrument includes the information notice and the nature of the study. Subsequently, the participant was asked to adhere to the study. Once study adherence was obtained, each critical care nurse completed the sociodemographic questionnaire with personal information as follows: *gender* (male, female); *age* (numeric); *educational qualification* (Regional school diploma, bachelor, Nursing degree, Master's degree in Nursing and Midwifery Sciences, 1st Level Master's, 2nd Level Master's, PhD); *years of service and particularly those in Critical Care departments* (numeric); finally the *type of Intensive Care Unit in which they were working during the study period* (General Intensive Care, Post-operative Intensive Care, Trauma Center Intensive Care).

The second section of the questionnaire is aimed at investigating the prevalence of securement systems within the ICUs of the interviewees as follows: *knowledge of external securement systems for indwelling urinary catheters* (yes, no, do not know); *availability of devices in their operational units* (yes, no, do not know); *device type* (ordinary tape, elastic bands, stat-lock, adhesive tape with tab, hydrocolloid-based adhesive); *securement site* (leg, abdomen, other).

The last part instead deals with the training of the interviewed nursing staff: *training courses* (yes, no, do not know); *most effective device* (ordinary tape, elastic bands, stat-lock, adhesive tape with tab, hydrocolloid-based adhesive); *outcome that can be improved* (device dislocation, infection, urethral meatus erosion, patient comfort); *degree of agreement on the highlighted outcomes*

(strongly disagree, partially agree, agree, strongly agree). The questionnaire was constructed based on information obtained from a recent literature review on external UC securement device.[10] An evaluation panel composed of critical care nurses assessed the questionnaire for clarity and neutrality on a 4-point Likert scale [0=not clear - 3=very clear; not neutral - very neutral]. Furthermore, a first administration of the questionnaire was conducted to determine the measure of test reliability through Cronbach's alpha on the degree of agreement, which is acceptable[26] (α=0.67), clarity [Mean=2.1; Standard deviation=0.87] and neutrality [Mean=2.2; Standard deviation=0.63].

Outcomes

The outcomes were considered from a recent literature review that identified i) Infection, ii) Device dislocation, iii) Urethral meatus erosion, and iv) Patient comfort.[10]

Ethical considerations

Ethical review and approval by an ethics committee for this study were waived due to its observational, online nature. All critical care nurses who voluntarily agreed to participate in the study were enrolled. Ethical considerations were indicated in the first part of the questionnaire, based on the principles established by the Data Protection Authority (DPA) in Italy. The study complied with the guidelines contained in the Declaration of Helsinki.

Statistical analysis

Numerical variables were considered mean and standard deviation, while categorical variables were considered absolute frequency and percentage. The chi-square test was applied to verify associations between variables. The association between variables was verified in the groups of critical care nurses who used/knew or did not use the securement systems against outcomes such as i) Infection, ii) Device dislocation, iii) Urethral meatus erosion, and iv) Patient comfort. Agreement values were considered (Agree=3; Strongly agree=4), while disagreement (Strongly disagree=1; Partially agree=2). The significance level was set for p-values <0.05. Analyses were conducted using the Statistical Package for Social Science (SPSS) software. 24.

Results

Sample description

The response rate to our survey is 81.7% of critical care nurses who meet the inclusion criteria. Our sample comprised 98 critical care nurses, 40.8% male (n=40) and 59.2% female (n=58). The age groups between 20-30 and 31-40 years were the most prevalent, with the same percentage of 33.7% (n=33). Most critical care nurses have a Bachelor's Degree in Nursing (48% n=47) and have 1-5 years of service (37.8% n=37), and 57.1% (n=56) worked in ICU. Regarding the type of ICU, the most prevalent is the General Intensive Care Unit, with a response rate of 51% (n=50); more details in Table 1.

Knowledge and attitude of critical care nurses

The association between variables in the groups of critical care nurses who used/knew or did not use the securement device gave the following results about the previously described outcomes (Table 2). Among critical care nurses familiar with the device, 89.4% (n=42) agree that its use can reduce catheter-associated urinary tract infections, compared to 10.6% (n=5) who disagree (p<0.007). A similar association was found for device dislocation, with 84.9% (n=62) agreeing and 15.1% (n=11) disagreeing (p<0.003). Regarding patient comfort, 83.3% (n=60) agree, while 16.7% (n=12) disagree (p<0.022). These results indicate that critical care nurses familiar with the device have a higher perception of its benefits. However, the data related to urinary meatus erosion cannot be considered as they are not significant (p<0.60).

Regarding the group of critical care nurses who have securement systems available in their operational unit, they reported an excellent association with device dislocation [Agreement= 56.2% (n=41) *vs* Disagreement=43.8% (n=32), p<0.0001], as well as in urinary meatus erosion [Agreement= 50.7% (n=37) *vs* Disagreement=49.3% (n=36), p<0.20] and patient comfort [Agreement= 58.2% (n=38) *vs* Disagreement=47.2% (n=34), p<0.003]. Unlike the previous data, the same group did not report a good association with infection since the data obtained is not significant (p<0.575).

Prevalence

From the results obtained, we can assess the level of knowledge on the subject, particularly the prevalence of these devices, highlighting that they are not consistently present across all the operational units considered.Out of 98 critical care nurses, 77.6%

Table 1. Sociodemographic Characteristics (n=98).

Variable	n	(%)
Gender		
Male	40	(40.8)
Female	58	(59.2)
Age		
20-30	33	(33.7)
31-40	33	(33.7)
41-50	21	(21.4)
51-65	11	(11.2)
Years of service		
1-5	37	(37.8)
6-10	17	(17.3)
11-15	14	(14.3)
16-20	9	(9.2)
21-25	10	(10.2)
26-30	5	(5.1)
31-35	6	(6.1)
Years of service in critical care area		
1-5	56	(57.1)
6-10	16	(16.3)
11-15	10	(10.2)
16-20	5	(5.1)
21-25	5	(5.1)
26-30	1	(1.0)
31-35	5	(5.1)
Education Level		
Regional school diploma	7	(7.1)
University Nursing diploma	4	(4.1)
Bachelor's degree in Nursing	47	(48.0)
Master's degree in nursing and Midwifery Sciences	14	(14.3)
1st Level master's degree	25	(25.5)
2nd Level master's Degree	1	(1.0)
Type of intensive care unit		
General intensive care unit	50	(51.0)
Post operative intensive care	8	(8.2)
Trauma center intensive care	40	(40.8)

(n=76) know external UC securement devices, but only 43.9% (n=43) have such devices available in their operational units. The critical care nurses who have these devices [43.9% (n=43)] indicated the StatLock system as the most prevalent device in their operational units, with 28.6% (n=28) and the one they consider most effective [54.1% (n=53)]. A major problem is related to staff training since 85.7% (n=84) of the participants have never attended a course on external UC protection systems. The outcomes they indicated as "improvable" if an adequate external securement device is used are: device dislocation for 75.5% (n=74); Infection for 32.7% (n=32), urinary meatus erosion for 65.3% (n=64), patient comfort for 69.4% (n=68), and skin lesion (due to pressure on the leg from the connecting tube) for 1% (n=1) (Figure 1). Critical care nurses could express their degree of agreement on the effectiveness of securement systems in improving the previously listed outcomes; the highest degree of agreement was found in urethral meatus erosion and device dislocation (Figure 2).

Discussion

This study explores critical care nurses' perceptions and attitudes regarding external UC securement and the prevalence of securement system use in critically ill patients admitted to the ICU. The key findings of this study are: i) 43.9% of the critical care nurses interviewed have access to urinary catheter securement systems; ii) the group of critical care nurses familiar with these devices believes their use can reduce catheter-associated infections, prevent dislocation, and improve patient comfort, compared to those unfamiliar with them; iii) the group of critical care nurses with access to these devices believes their use can reduce dislocation, prevent erosion of the urinary meatus, and improve patient comfort, compared to those who do not use them.

The literature describes that the prevalence of indwelling urinary catheters with fixation is significantly lower than those without securement, and these devices are more commonly found in surgical rather than medical units.[16] It has been demonstrated that using the StatLock device reduced the incidence of catheter-associated infections by 45% compared to using other fixation devices such as tape, Velcro strap, CathSecure, or none.[15] Another outcome that can be improved, as demonstrated by MacNeil and colleagues, is the dislocation of the device, as the fixation of the UC eliminated traction forces at the bladder neck on the distal, proximal, and mid-catheter segments.[14]

Our findings regarding the percentage of use and availability of these devices in hospitalizations are comparable to those of Appah and colleagues, as our study also highlighted the limited

Table 2. Association between nurses' knowledge and availability of securement devices in *ICU vs. outcomes (n=98).

Outcome	Knowledge					Availability of Device				
	Yes		No		p	Yes		No		**p
	N	(%)	N	(%)		N	(%)	N	(%)	
Infection										
Agreement	42	(89.4)	5	(10.6)	.007	22	(46.8)	25	(53.2)	.575
Disagreement	34	(66.7)	17	(33.3)		21	(41.2)	30	(58.8)	
Dislocation										
Agreement	62	(89.4)	11	(15.1)	.003	41	(56.2)	32	(43.8)	.0001
Disagreement	14	(56.0)	11	(44.0)		2	(8.0)	23	(92.0)	
Meatal erosion										
Agreement	60	(82.2)	13	(17.8)	.060	37	(50.7)	36	(49.3)	.020
Disagreement	16	(64.0)	9	(36.0)		6	(24.0)	19	(76.0)	
Comfort										
Agreement	60	(83.3)	12	(16.7)	.022	38	(52.8)	34	(47.2)	.003
Disagreement	16	(61.5)	10	(38.5)		5	(19.2)	21	(80.8)	

*ICU, intensive care unit; **P-value <0.05; Outcomes (Infection, Dislocation, Meatal Erosion, Comfort).

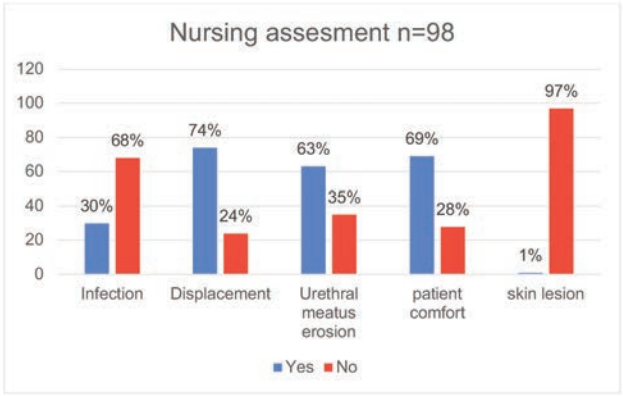

Figure 1. Nursing assessment.

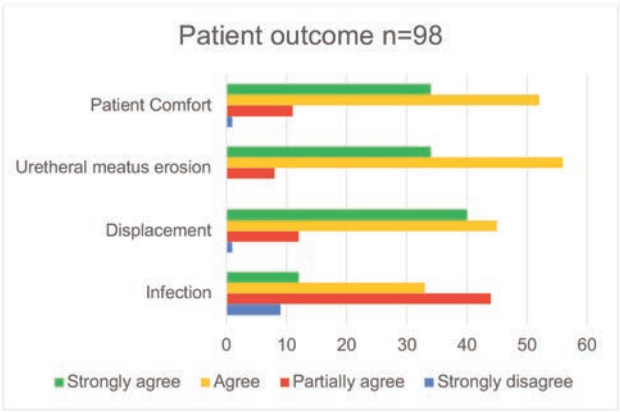

Figure 2. Patient outcome.

availability of securement devices in most of the hospitals analyzed, as demonstrated by Appah.[16] The results obtained from the group of critical care nurses familiar with securement devices are similar to those of Darouiche;[15] this group believes believes, that using these devices reduces the incidence of catheter-associated infections. Contrary to the previous finding, the results of the group of critical care nurses who use external securement devices disagree with Darouiche's study, as they do not believe that external fixation reduces the risk of infection. The results of this group are instead consistent with the study conducted by McNeill and colleagues,[27] as this group of critical care nurses agrees on the improved outcomes such as device dislocation and erosion of the urinary meatus.

Limitations and strengths

Managing urinary catheters in intensive care units is a highly relevant issue for daily nursing practice, making this study particularly useful for improving the quality of care. Additionally, using a purpose-built questionnaire, validated by a panel of experts and with good reliability (α=0.67), adds robustness to the collected data. Another positive aspect is the focus on clinical outcomes, such as infection, device dislocation, and erosion of the urethral meatus, which allows for a precise evaluation of the impact of using a securement device. Finally, comparing results with existing literature allows the study to be placed within the context of available evidence, providing a more comprehensive view of the situation.

However, the study also presents some limitations. The first limitation concerns the sample, which is geographically limited to critical care nurses in Southern Italy, potentially reducing the generalizability of the results compared to other regions or countries. Furthermore, a cross-sectional observational study does not allow for establishing causal relationships between using securement devices and clinical outcomes. Another potential limitation is related to the voluntary participation of nurses, which could create selection bias, as it may have attracted greater participation from critical care nurses who are more interested or informed on the subject. The absence of long-term follow-up further limits the ability to observe the evolution of critical care nurses' knowledge and practices and the real impact of securement devices on clinical outcomes. The limited availability of these devices in the examined units may have also influenced the critical care nurses' ability to apply acquired knowledge, with potential repercussions on the study's results.

Implications for clinical practice and future research

The results of this study have important implications for clinical practice and future research. The limited availability and use of external securement devices for UC in intensive care units highlight the need for targeted interventions to improve the quality of care. Critical care nurse education is a crucial factor: investing in specific training programs on external securement devices could increase awareness of the benefits of such devices and promote their broader and more consistent adoption. This approach could reduce the incidence of complications such as infections, device dislocation, and erosion of the urethral meatus, thereby improving patient comfort.

It is also essential to investigate the comparative effectiveness of different securement devices further, mainly through studies that can provide more robust data. Additionally, it is necessary to explore the economic impact of the widespread implementation of such devices, evaluating the cost-benefit ratio concerning complications. Finally, future research could explore implementing standardized guidelines for external securement devices, considering the specificities of different types of patients and units, to optimize care and ensure better clinical outcomes.

Conclusions

Almost all critical care nurses interviewed have an excellent basic knowledge of the subject, but less than half have the opportunity to implement and apply their knowledge, as these devices are not available in most of the units. A spontaneous question arises: "Why is the opportunity to apply this knowledge not provided?" These devices should be supplied in all units to improve patient care. In most of the units where securement devices are available, the most utilized devices are StatLock systems, indicating that, while there is still a small number of respondents using outdated methods (standard tape and elastic bands), it is important to note that the use of recent, study-supported devices that ensure better patient outcomes has also been recorded.[15]

Despite basic knowledge on the subject, most respondents stated that they had never attended training courses on the matter. Lack of training leads to a decreased awareness of the benefits of this practice and does not encourage the use or request for these devices by nursing staff in their units. If these devices are to be implemented, investment in training is necessary, explaining the importance and benefits they bring to patients, thus encouraging their use.

Regarding outcomes, a difference in knowledge was recorded between the groups of critical care nurses who use/are familiar with securement devices and those who do not use/are not familiar with them, demonstrating that if nursing staff had the opportunity to use these devices, they would also gain more excellent knowledge of the improvements they bring to patient outcomes. This study has partially demonstrated the need to invest both in training courses and in providing the best available devices to all hospital settings so that the skills of each critical care nurse can be put into practice with the ultimate goal of ensuring and providing the best possible care for patients.

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Informed consent: all patients participating in this study signed a written informed consent form for participating in this study.

Patient consent for publication: all nurses involved in the study were provided with a detailed explanation of the nature of the research and voluntarily agreed to participate, giving their informed consent both for participation in the study and for the publication of anonymized information, in full compliance with ethical and legal standards.

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SCENARIO®

La gestione dello shock anafilattico da parte di un mezzo di soccorso avanzato a leadership infermieristica: un case report

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RIASSUNTO

Introduzione: l'anafilassi è una reazione allergica sistemica acuta e potenzialmente letale che si manifesta rapidamente dopo l'esposizione a un allergene, con sintomi come difficoltà respiratorie, gonfiore delle vie aeree, ipotensione e rash cutanei. La somministrazione di adrenalina intramuscolare è il trattamento di prima scelta per gestirla.
Materiali e Metodi: è stato condotto un case report su un caso di anafilassi grave gestito da un mezzo di soccorso avanzato (ambulanza) a leadership infermieristica in Regione Toscana, evidenziando l'efficacia del trattamento e le criticità nel processo.
Risultati: è stata somministrata adrenalina e altri farmaci secondo le procedure infermieristiche avanzate, con un miglioramento significativo dei parametri vitali della paziente durante il trasporto.
Discussione: questo caso clinico evidenzia l'importanza di un intervento rapido ed efficace da parte del personale infermieristico extraospedaliero nella gestione dell'anafilassi e sottolinea la necessità di promuovere l'educazione sull'uso tempestivo degli auto-iniettori di adrenalina a domicilio.

Parole chiave: anafilassi, reazione allergica sistemica, dipartimento di emergenza urgenza, caso clinico.

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Introduzione

L'anafilassi è una reazione di ipersensibilità sistemica grave, potenzialmente letale, che può manifestarsi rapidamente dopo l'esposizione a un allergene. I termini corretti per questa condizione sono "anafilassi", "reazione anafilattoide" o "pseudo-allergia" e devono essere preferiti a "shock anafilattico" poiché lo shock non sempre si verifica nei pazienti.[1] L'anafilassi è una problematica globale causata principalmente da alimenti, farmaci o punture di insetti. In Europa, i tassi di incidenza variano da 1,5 a 7,9 per 100.000 persone/anno, con circa lo 0,3% della popolazione che sperimenta un episodio di anafilassi nel corso della vita.[2] La gravità della reazione può compromettere vari sistemi del corpo, ma nella maggior parte dei casi coinvolge la cute, le vie aeree ed il sistema cardiovascolare.[1,2] L'anafilassi può comportare difficoltà respiratorie, gonfiore delle vie aeree, ipotensione, rash cutanei e shock. Generalmente, i segni e i sintomi dell'anafilassi si manifestano entro poche ore dopo l'esposizione all'allergene, ma possono insorgere anche solo dopo pochi minuti come nel caso di farmaci somministrati per via endovenosa.[2,3] Il trattamento del paziente con anafilassi segue lo schema ABCDE (Airway, Breathing, Circulation, Disability, Exposure) utilizzato in emergenza, con l'adrenalina intramuscolare come trattamento di prima linea per la sua capacità di causare vasocostrizione periferica, invertendo l'ipotensione e riducendo l'edema delle mucose.[1,4] L'adrenalina agisce sui recettori beta-1 e beta-2, migliorando la contrattilità cardiaca, riducendo il rilascio di mediatori infiammatori e alleviando la broncocostrizione.[1] Dopo la somministrazione di adrenalina, si possono considerare farmaci aggiuntivi come antagonisti H1 e H2, corticosteroidi, beta2 agonisti e glucagone.[5] È cruciale che i pazienti con storia di anafilassi siano dotati di autoiniettori di adrenalina e siano educati sul loro corretto utilizzo. Nonostante le raccomandazioni di portare sempre due autoiniettori, una significativa percentuale di pazienti non lo fa, aumentando il rischio di esiti gravi in caso di nuovo episodio.[6] Inoltre, è fondamentale monitorare i pazienti per almeno 6-8 ore dopo una reazione anafilattica e fornire loro istruzioni dettagliate per evitare futuri contatti con gli allergeni e all'uso degli autoiniettori.[2,6] L'applicazione di specifici protocolli o istruzioni operative, da parte dell'infermiere presente a bordo delle ambulanze di soccorso avanzato a leadership infermieristica, può divenire un efficace strumento d'intervento per garantire l'omogeneità delle attività prestate su tutto il territorio regionale, anche in questi casi.[7] Questo case report descrive un episodio di shock anafilattico in ambito extraospedaliero. La finalità di questo lavoro è analizzare il ruolo dell'infermiere e della centrale operativa in relazione alla necessità di un intervento tempestivo ed efficace, per cercare di fare emergere criticità riscontrate e proporre strategie utili per il loro superamento.

Case Report

Chiamata di soccorso

Alle ore 11:37 una centrale operativa di emergenza sanitaria territoriale Toscana riceve, via Numero Unico di Emergenza 112 (NUE), una richiesta di soccorso. Il chiamante riferisce che, in un borgo di campagna a circa dieci chilometri da un capoluogo di provincia, una donna di 83 anni, alle ore 11 circa, è stata attaccata da uno sciame di calabroni ricevendo sei punture da questi insetti. La signora che ha una storia di allergia al veleno degli imenotteri non possiede un auto-iniettore di adrenalina e, senza successo, ha cercato di procurarsene uno alla vicina farmacia. Prima di recarsi alla vicina farmacia, la signora ha assunto due compresse di METILPREDNISOLONE ma le condizioni sono peggiorate rapidamente. Al momento della chiamata, la paziente cosciente presenta edema del volto, dispnea, agitazione psicomotoria e confusione mentale. L'operatore della centrale operativa riconosce i sintomi di anafilassi in atto, assegna al caso un codice di gravità "rosso" (situazione di emergenza assoluta che necessita di massima priorità d'intervento; è assegnato a quei casi in cui gli indicatori ottenuti prospettano un imminente pericolo di vita per grave compromissione in atto di una o più funzioni vitali principali) e dirotta sul luogo dell'incidente un'ambulanza a leadership infermieristica, precedentemente diretta a un intervento con codice di gravità inferiore.

Arrivo dei soccorsi

L'ambulanza giunge sul target alle 11:43. Alla rapida valutazione iniziale, l'infermiere trova la paziente seduta, visibilmente dispnoica, con stridore inspiratorio, turgore delle giugulari, cianosi centrale e impossibilità all'eloquio a causa dell'edema del volto e delle vie aeree. La pressione arteriosa non è rilevabile, la frequenza cardiaca è di 110 bpm, refill capillare >4 secondi, frequenza respiratoria è di 48 atti/minuto, respiro addominale ed uso dei muscoli accessori, la saturazione di ossigeno è del 90% con onda pletismografica non valida, il punteggio Glasgow Coma Scale (GCS) di 15/15. Secondo procedura per casi di anafilassi (Figura 1), l'infermiere somministra 0,5 mg di adrenalina intramuscolo e contatta la centrale operativa per organizzare un rendez-vous con un mezzo medicalizzato, dato la grave compromissione delle vie aeree. La centrale operativa comunica che non sono disponibili mezzi medicalizzati con medico a bordo in tempi utili per il caso, con un tempo stimato di arrivo sul target di 35 minuti, e suggerisce un approccio "scoop and run" (trasporto rapido al pronto soccorso) con un tempo target di arrivo al Dipartimento di Emergenza Urgenza e Accettazione (DEA) di 10 minuti. L'infermiere predispone un accesso venoso periferico (18G) sul braccio sinistro, somministra 10 mg di clorfenamina intramuscolo e consulta telefonicamente il medico della centrale operativa per l'aggiornamento della terapia farmacologica. Dopo di che, inizia la somministrazione di idrocortisone 1000 mg per via endovenosa (500 mg in bolo e 500 mg in infusione lenta) ed aerosol terapia con 1 mg di adrenalina. All'inizio della terapia endovenosa in infusione lenta, la paziente viene posta in ambulanza e l'infermiere procede a rivalutazione dei parametri vitali: pressione arteriosa 160/100 mmHg, frequenza cardiaca 112 bpm, frequenza respiratoria 40 atti/minuto, saturazione 100% con ossigenoterapia a 10 litri/minuto e onda pletismografica valida. Oltre ai parametri vitali della paziente, l'infermiere effettua una rivalutazione dell'esame obiettivo: permane edema del volto, all'auscultazione si evidenzia una regressione dei sibili inspiratori, diminuzione dell'utilizzo dei muscoli accessori per la respirazione, regressione della cianosi centrale e miglioramento del tempo di refill capillare con un timing di 2 secondi; neurologicamente la paziente mostra una regressione dell'agitazione psicomotoria e maggiore attinenza all'esecuzione di ordini semplici, modesta regressione dell'afonia con formulazione di frasi brevi. Risconto, all'esame testa piedi, di punture di imenottero sul torace e sul giugulo.

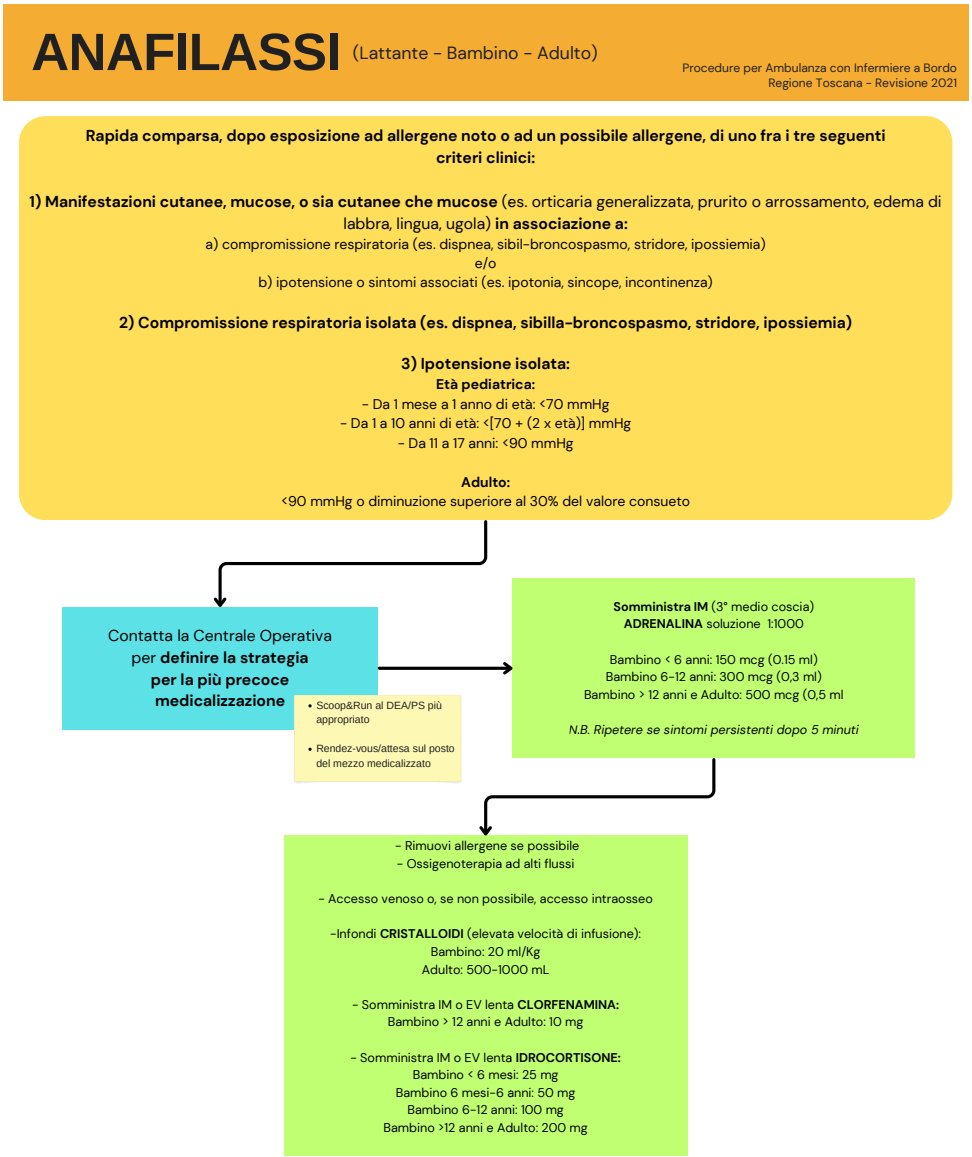
Trasporto ed arrivo in DEA

La centrale operativa allerta il DEA di destinazione per l'arrivo imminente di una paziente con shock anafilattico. Il trasporto in ambulanza parte dal luogo dell'evento alle 12:02 in codice 3 (Situazione di emergenza: grave alterazione delle funzioni vitali). Durante il trasporto, l'infermiere infonde circa 750 ml di CRISTALLOIDI e somministra 0,5 mg di ADRENALINA intramuscolo in seguito a riacutizzazione dei sintomi respiratori.

L'arrivo in DEA avviene alle 12:13: i parametri all'ingresso sono pressione arteriosa 180/111 mmHg, frequenza cardiaca 110 bpm, frequenza respiratoria 44 atti/minuto, saturazione 100% con ossigenoterapia in corso (10 litri/minuto). All'esame obiettivo: lieve regressione dell'edema al volto, permane modesto edema in zona perioculare; all'auscultazione regressione dei sibili inspiratori, completa regressione dell'uso dei muscoli accessori per la respirazione, tempo di refill capillare con un timing inferiore ai 2 secondi; neurologicamente la paziente esegue ordini semplici con regressione della confusione mentale, modesta regressione dell'afonia con formulazione di frasi brevi.

Discussione

Il caso esaminato documenta la gestione di un intervento di emergenza con l'invio di un'ambulanza di soccorso avanzato a leadership infermieristica, con l'applicazione di protocolli infermieristici approvati dal coordinamento delle centrali operative di emergenza sanitaria terrioriale di Regione Toscana, la cui ultima revisione risale al 2021.[8] L'infermiere in turno ha applicato procedure avanzate, inclusa la somministrazione di farmaci salvavita (Figura 1). In risposta alla gravità della condizione della paziente, l'equipaggio ha optato per l'approccio "scoop & run", che privilegia un trasporto rapido al pronto soccorso per l'inizio tempestivo delle cure ospedaliere, rispetto al metodo "stay & play", che implica un intervento più esteso sul luogo dell'evento prima del trasporto.[9] L'infermiere ha contattato telefonicamente il medico della centrale operativa per consulenza clinica, il che ha permesso di adattare tempestivamente gli interventi alle condizioni cliniche del paziente. La cooperazione tra l'infermiere del territorio ed il medico di centrale operativa è stata determinante per l'esito positivo dell'intervento. Nonostante ciò, sono emerse alcune criticità: l'incapacità della paziente di comunicare a causa dello shock anafilattico ha impedito una raccolta completa delle informazioni anamnestiche, limitando l'applicazione del modello mnemonico AMPLE (Allergies, Medications, Past medical history, Last meal, Events).[16] Inoltre, la paziente, nota per allergia alle punture di imenotteri, non possedeva auto iniettori di adrenalina, tentando di procurarseli in farmacia. Il trattamento immediato con adrenalina



intramuscolare è cruciale per affrontare lo shock anafilattico; solo successivamente è opportuno aggiungere altre terapie farmacologiche, come raccomandato dall'European Academy of Allergy and Clinical Immunology (EAACI) nelle ultime linee guida pubblicate.[10] L'uso di criteri clinici per l'identificazione dell'anafilassi e la somministrazione tempestiva di adrenalina intramuscolare rappresentano il trattamento di prima linea, con autoiniettori disponibili. A tal proposito è consigliata una formazione strutturata e completa per le persone a rischio di anafilassi per prevenire gravi esiti clinici.

Conclusioni

Questo caso clinico evidenzia come nella gestione dell'anafilassi dei soggetti a rischio sia fondamentale: da un lato, l'intervento rapido ed efficace del personale extraospedaliero e, dall'altro, il miglioramento dell'educazione sanitaria sull'uso e la disponibilità degli auto-iniettori di adrenalina per pazienti, familiari e caregiver.[6] Un'adeguata formazione sanitaria potrebbe ottimizzare la risposta alle emergenze allergiche, riducendo il rischio di recidive di reazioni anafilattiche e prevenendo così ospedalizzazioni e costi associati.

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Approvazione etica e consenso alla partecipazione: per questo caso di studio non è stata richiesta l'approvazione di un comitato etico da parte del Dipartimento, poiché questo articolo non contiene studi con partecipanti umani o animali. Il consenso informato è stato ottenuto dal paziente incluso in questo studio.

Consenso del paziente per la pubblicazione: il paziente ha dato il suo consenso scritto all'utilizzo dei suoi dati personali per la pubblicazione di questo caso clinico e delle immagini che lo accompagnano.

Disponibilità di dati e materiali: tutti i dati alla base dei risultati sono completamente disponibili.

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SCENARIO®

Perception and attitudes of critical care nurses on external urinary catheter securement and the prevalence of securement devices in critically ill patients

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ABSTRACT

Introduction: the literature describes the limited use of urinary catheter securement devices (UC). Critical care nurses (CCNs) consider UC security an important activity for nursing care. Our objective was to determine CCN perceptions and attitudes to external UC security and the prevalence of securement devices in seriously ill patients.

Materials and Methods: a cross-sectional observation study was carried out between the CCNs of southern Italy between May and July 2023. All CCNs with a probationary period of less than six months were excluded. Chi-square tests assessed the correlation between variables. The significance level was set to p> 0.05.

Results: a total of 77.6% (n=76) know UC securement devices, but only 43.9% (n=43) have these devices available in operational units. CCNs with security devices reported reduced urinary tract infections [(89.5% n=42) compared to (10.6% n=5), p=0.007] and patient comfort [(83%, n=60) versus (16.7%, n=12), p=0.02] and dislocation [(84.9%, n=62) versus (15.1%, n=11)]. Changes can be reduced according to CCNs with safety devices [56.2% (n=41) versus 43.8% (n=32), p=0.0001].

Conclusions: the results of this study will significantly contribute to incorporating this activity into standard nursing care and improving the quality of care. Future research should consider the potential effects of nursing care.

Key words: Urinary catheters, attitude, perception, critical care nurses, securement device.

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Introduction

The Urinary Catheter (UC) is the most used indwelling invasive device in hospitalized patients, with 17.5% of patients in 66 European hospitals[1] and 23.6% in 183 U.S. hospitals[2]. Despite widespread use, these devices are not free from adverse events.[1,2] Several studies showed that urinary catheterization can cause severe mechanical trauma (perforation, partial urethral damage, and urinary leakage), symptomatic bacterial infection, anaphylaxis, catheter toxicity, hypersensitivity,[3] dislocation, and pressure ulcers.[4-7]

The literature describes the effectiveness of adhesive securement devices for vascular catheters, reporting interesting and innovative results,[8] but their effectiveness on urinary catheterization is often overlooked.[9] Recently, a literature review has shown encouraging results regarding external UC securement.[10] The studies included in the review reported a reduction in adverse events such as i) infection, ii) device dislocation, and iii) urethral meatus erosion while highlighting an improvement in iv) patient comfort,[10] thanks to the use of appropriate external securement systems such as containment straps and StatLock® and GripLock® adhesive systems.[11,12] In research by Tracy and colleagues in 2000, the effectiveness of adhesive securement systems compared to traditional methods such as safety pins and adhesive tape was evaluated.[13] The UCs of patients secured with adhesive securement systems did not remain in place for less time compared to urinary catheters of patients with UCs secured with adhesive tape or safety pin. The authors conclude that the sample is too small to be generalized, but the initial results show a significant area of interest for urinary catheter securement. A similar study was conducted by Macneil and colleagues, which, comparing the data of the force exerted by the UC on the bladder neck,[14] highlighted the apparent reduction of such force using external securement devices. Even UC-related infection can be reduced thanks to using such devices, as demonstrated by Darouiche,[15] with a 45% reduced infection rate on a sample having the UC secured with a StatLock® device. Appah and colleagues have shown that only 18% of catheterized patients in the hospital structure under study have the correct UC securement device,[16] demonstrating how this nursing practice is not widely implemented. The study by Orme and colleagues in 2008[17] analyzes three clinical cases intending to evaluate the effectiveness of the adhesive securement device for indwelling urinary catheters. The results show that standard tape did not ensure the necessary securement; the adhesive system with plastic housing proved cumbersome, difficult to remove, and uncomfortable for the patient. Securement straps ensure proper fixation but often slip and rub, leaving marks on the thigh. On the other hand, the hydrocolloid-based system proved easy to apply and ensured excellent device stability. Although external securement devices are designed to promote device stability, accidental catheter dislocation was, and still is today, a problem encountered by many patients.[18-21] The existing literature suggests that UCs should be adequately secured to increase device stability and reduce adverse events.[22-25] Critical care nurses consider external UC securement an essential aspect of care, but this perception does not align with current practice.[9] Moreover, the available literature on the subject is still insufficient, mainly due to the limited number of studies conducted in the international field.[10] Future research should also be oriented toward UC securement systems to make this invasive but essential device safer.[8-10] Currently, critical care nurses are still not highly inclined to promote the use of UC securement devices, even though their implementation would undoubtedly improve the standards of care for critically ill patients admitted to the Intensive Care Unit (ICU). The results of this study aim to understand the barriers that hinder the correct use of external UC securement in critically ill patients to include this practice as a standard of care. We hypothesize that external UC securement systems are rarely used, and critical care nurses do not consider this practice essential in the care process of critically ill patients. Therefore, this study aims to investigate the perception and attitudes of critical care nurses on external UC securement and the prevalence of securement devices in critically ill patients admitted to ICU.

Materials and Methods

Study design and research question

A cross-sectional observational study was conducted among critical care nurses. The question that guided our study is: What is the prevalence of external urinary catheter securement systems? Moreover, what are the perceptions and attitudes of critical care nurses on the effectiveness of these devices?

Data collection and participants

Data were collected between May 25, 2023, and July 31, 2023, through a free platform for creating surveys, "Google Forms". Through the local representatives of Southern Italy of the National Association of Critical Care Nurses (ANIARTI), an ad hoc constructed questionnaire was distributed. The study's first phase included identifying representatives who were available to participate. Participation was voluntary. Once the available representatives were identified, they were asked to disseminate the questionnaire link among their work colleagues. All critical care nurses who expressed consent to participate in the study were enrolled after adhering to the information notice of both sexes. All critical care nurses with less than 6 months of service in the probationary period were excluded. Subsequently, the data obtained were imported into the Excel worksheet for data analysis.

Instrument

An ad hoc tool was created for data collection. The first part of the instrument includes the information notice and the nature of the study. Subsequently, the participant was asked to adhere to the study. Once study adherence was obtained, each critical care nurse completed the sociodemographic questionnaire with personal information as follows: *gender* (male, female); *age* (numeric); *educational qualification* (Regional school diploma, bachelor, Nursing degree, Master's degree in Nursing and Midwifery Sciences, 1st Level Master's, 2nd Level Master's, PhD); *years of service and particularly those in Critical Care departments* (numeric); finally the *type of Intensive Care Unit in which they were working during the study period* (General Intensive Care, Post-operative Intensive Care, Trauma Center Intensive Care).

The second section of the questionnaire is aimed at investigating the prevalence of securement systems within the ICUs of the interviewees as follows: *knowledge of external securement systems for indwelling urinary catheters* (yes, no, do not know); *availability of devices in their operational units* (yes, no, do not know); *device type* (ordinary tape, elastic bands, stat-lock, adhesive tape with tab, hydrocolloid-based adhesive); *securement site* (leg, abdomen, other).

The last part instead deals with the training of the interviewed nursing staff: *training courses* (yes, no, do not know); *most effective device* (ordinary tape, elastic bands, stat-lock, adhesive tape with tab, hydrocolloid-based adhesive); *outcome that can be improved* (device dislocation, infection, urethral meatus erosion, patient comfort); *degree of agreement on the highlighted outcomes*

(strongly disagree, partially agree, agree, strongly agree). The questionnaire was constructed based on information obtained from a recent literature review on external UC securement device.[10] An evaluation panel composed of critical care nurses assessed the questionnaire for clarity and neutrality on a 4-point Likert scale [0=not clear - 3=very clear; not neutral - very neutral]. Furthermore, a first administration of the questionnaire was conducted to determine the measure of test reliability through Cronbach's alpha on the degree of agreement, which is acceptable[26] (α=0.67), clarity [Mean=2.1; Standard deviation=0.87] and neutrality [Mean=2.2; Standard deviation=0.63].

Outcomes

The outcomes were considered from a recent literature review that identified i) Infection, ii) Device dislocation, iii) Urethral meatus erosion, and iv) Patient comfort.[10]

Ethical considerations

Ethical review and approval by an ethics committee for this study were waived due to its observational, online nature. All critical care nurses who voluntarily agreed to participate in the study were enrolled. Ethical considerations were indicated in the first part of the questionnaire, based on the principles established by the Data Protection Authority (DPA) in Italy. The study complied with the guidelines contained in the Declaration of Helsinki.

Statistical analysis

Numerical variables were considered mean and standard deviation, while categorical variables were considered absolute frequency and percentage. The chi-square test was applied to verify associations between variables. The association between variables was verified in the groups of critical care nurses who used/knew or did not use the securement systems against outcomes such as i) Infection, ii) Device dislocation, iii) Urethral meatus erosion, and iv) Patient comfort. Agreement values were considered (Agree=3; Strongly agree=4), while disagreement (Strongly disagree=1; Partially agree=2). The significance level was set for p-values <0.05. Analyses were conducted using the Statistical Package for Social Science (SPSS) software. 24.

Results

Sample description

The response rate to our survey is 81.7% of critical care nurses who meet the inclusion criteria. Our sample comprised 98 critical care nurses, 40.8% male (n=40) and 59.2% female (n=58). The age groups between 20-30 and 31-40 years were the most prevalent, with the same percentage of 33.7% (n=33). Most critical care nurses have a Bachelor's Degree in Nursing (48% n=47) and have 1-5 years of service (37.8% n=37), and 57.1% (n=56) worked in ICU. Regarding the type of ICU, the most prevalent is the General Intensive Care Unit, with a response rate of 51% (n=50); more details in Table 1.

Knowledge and attitude of critical care nurses

The association between variables in the groups of critical care nurses who used/knew or did not use the securement device gave the following results about the previously described outcomes (Table 2). Among critical care nurses familiar with the device, 89.4% (n=42) agree that its use can reduce catheter-associated urinary tract infections, compared to 10.6% (n=5) who disagree (p<0.007). A similar association was found for device dislocation, with 84.9% (n=62) agreeing and 15.1% (n=11) disagreeing (p<0.003). Regarding patient comfort, 83.3% (n=60) agree, while 16.7% (n=12) disagree (p<0.022). These results indicate that critical care nurses familiar with the device have a higher perception of its benefits. However, the data related to urinary meatus erosion cannot be considered as they are not significant (p<0.60).

Regarding the group of critical care nurses who have securement systems available in their operational unit, they reported an excellent association with device dislocation [Agreement= 56.2% (n=41) *vs* Disagreement=43.8% (n=32), p<0.0001], as well as in urinary meatus erosion [Agreement= 50.7% (n=37) *vs* Disagreement=49.3% (n=36), p<0.20] and patient comfort [Agreement= 58.2% (n=38) *vs* Disagreement=47.2% (n=34), p<0.003]. Unlike the previous data, the same group did not report a good association with infection since the data obtained is not significant (p<0.575).

Prevalence

From the results obtained, we can assess the level of knowledge on the subject, particularly the prevalence of these devices, highlighting that they are not consistently present across all the operational units considered.Out of 98 critical care nurses, 77.6%

Table 1. Sociodemographic Characteristics (n=98).

Variable	n	(%)
Gender		
Male	40	(40.8)
Female	58	(59.2)
Age		
20-30	33	(33.7)
31-40	33	(33.7)
41-50	21	(21.4)
51-65	11	(11.2)
Years of service		
1-5	37	(37.8)
6-10	17	(17.3)
11-15	14	(14.3)
16-20	9	(9.2)
21-25	10	(10.2)
26-30	5	(5.1)
31-35	6	(6.1)
Years of service in critical care area		
1-5	56	(57.1)
6-10	16	(16.3)
11-15	10	(10.2)
16-20	5	(5.1)
21-25	5	(5.1)
26-30	1	(1.0)
31-35	5	(5.1)
Education Level		
Regional school diploma	7	(7.1)
University Nursing diploma	4	(4.1)
Bachelor's degree in Nursing	47	(48.0)
Master's degree in nursing and Midwifery Sciences	14	(14.3)
1st Level master's degree	25	(25.5)
2nd Level master's Degree	1	(1.0)
Type of intensive care unit		
General intensive care unit	50	(51.0)
Post operative intensive care	8	(8.2)
Trauma center intensive care	40	(40.8)

(n=76) know external UC securement devices, but only 43.9% (n=43) have such devices available in their operational units. The critical care nurses who have these devices [43.9% (n=43)] indicated the StatLock system as the most prevalent device in their operational units, with 28.6% (n=28) and the one they consider most effective [54.1% (n=53)]. A major problem is related to staff training since 85.7% (n=84) of the participants have never attended a course on external UC protection systems. The outcomes they indicated as "improvable" if an adequate external securement device is used are: device dislocation for 75.5% (n=74); Infection for 32.7% (n=32), urinary meatus erosion for 65.3% (n=64), patient comfort for 69.4% (n=68), and skin lesion (due to pressure on the leg from the connecting tube) for 1% (n=1) (Figure 1). Critical care nurses could express their degree of agreement on the effectiveness of securement systems in improving the previously listed outcomes; the highest degree of agreement was found in urethral meatus erosion and device dislocation (Figure 2).

Discussion

This study explores critical care nurses' perceptions and attitudes regarding external UC securement and the prevalence of securement system use in critically ill patients admitted to the ICU. The key findings of this study are: i) 43.9% of the critical care nurses interviewed have access to urinary catheter securement systems; ii) the group of critical care nurses familiar with these devices believes their use can reduce catheter-associated infections, prevent dislocation, and improve patient comfort, compared to those unfamiliar with them; iii) the group of critical care nurses with access to these devices believes their use can reduce dislocation, prevent erosion of the urinary meatus, and improve patient comfort, compared to those who do not use them.

The literature describes that the prevalence of indwelling urinary catheters with fixation is significantly lower than those without securement, and these devices are more commonly found in surgical rather than medical units.[16] It has been demonstrated that using the StatLock device reduced the incidence of catheter-associated infections by 45% compared to using other fixation devices such as tape, Velcro strap, CathSecure, or none.[15] Another outcome that can be improved, as demonstrated by MacNeil and colleagues, is the dislocation of the device, as the fixation of the UC eliminated traction forces at the bladder neck on the distal, proximal, and mid-catheter segments.[14]

Our findings regarding the percentage of use and availability of these devices in hospitalizations are comparable to those of Appah and colleagues, as our study also highlighted the limited

Table 2. Association between nurses' knowledge and availability of securement devices in *ICU vs. outcomes (n=98).

Outcome	Knowledge					Availability of Device				
	Yes		No		p	Yes		No		**p
	N	(%)	N	(%)		N	(%)	N	(%)	
Infection										
Agreement	42	(89.4)	5	(10.6)	.007	22	(46.8)	25	(53.2)	.575
Disagreement	34	(66.7)	17	(33.3)		21	(41.2)	30	(58.8)	
Dislocation										
Agreement	62	(89.4)	11	(15.1)	.003	41	(56.2)	32	(43.8)	.0001
Disagreement	14	(56.0)	11	(44.0)		2	(8.0)	23	(92.0)	
Meatal erosion										
Agreement	60	(82.2)	13	(17.8)	.060	37	(50.7)	36	(49.3)	.020
Disagreement	16	(64.0)	9	(36.0)		6	(24.0)	19	(76.0)	
Comfort										
Agreement	60	(83.3)	12	(16.7)	.022	38	(52.8)	34	(47.2)	.003
Disagreement	16	(61.5)	10	(38.5)		5	(19.2)	21	(80.8)	

*ICU, intensive care unit; **P-value <0.05; Outcomes (Infection, Dislocation, Meatal Erosion, Comfort).

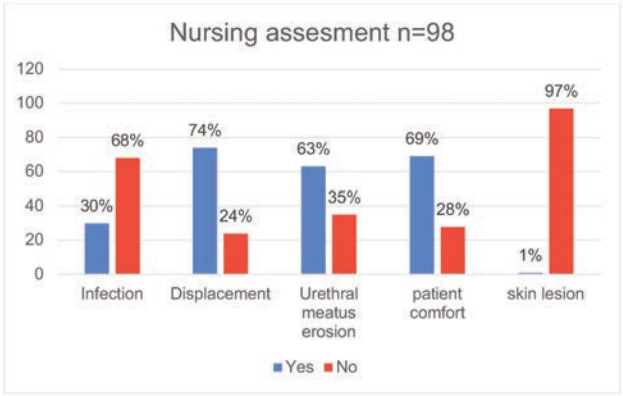

Figure 1. Nursing assessment.

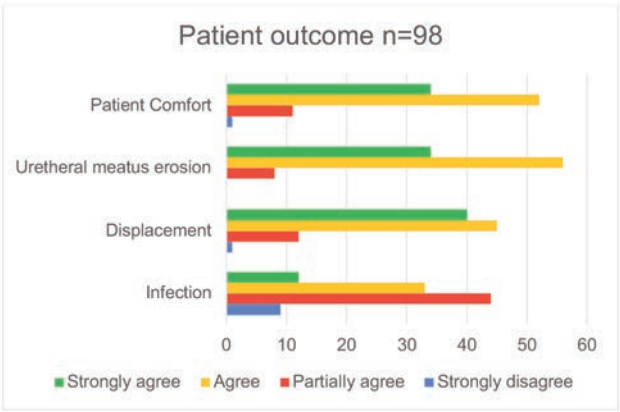

Figure 2. Patient outcome.

availability of securement devices in most of the hospitals analyzed, as demonstrated by Appah.[16] The results obtained from the group of critical care nurses familiar with securement devices are similar to those of Darouiche;[15] this group believes believes, that using these devices reduces the incidence of catheter-associated infections. Contrary to the previous finding, the results of the group of critical care nurses who use external securement devices disagree with Darouiche's study, as they do not believe that external fixation reduces the risk of infection. The results of this group are instead consistent with the study conducted by McNeill and colleagues,[27] as this group of critical care nurses agrees on the improved outcomes such as device dislocation and erosion of the urinary meatus.

Limitations and strengths

Managing urinary catheters in intensive care units is a highly relevant issue for daily nursing practice, making this study particularly useful for improving the quality of care. Additionally, using a purpose-built questionnaire, validated by a panel of experts and with good reliability (α=0.67), adds robustness to the collected data. Another positive aspect is the focus on clinical outcomes, such as infection, device dislocation, and erosion of the urethral meatus, which allows for a precise evaluation of the impact of using a securement device. Finally, comparing results with existing literature allows the study to be placed within the context of available evidence, providing a more comprehensive view of the situation.

However, the study also presents some limitations. The first limitation concerns the sample, which is geographically limited to critical care nurses in Southern Italy, potentially reducing the generalizability of the results compared to other regions or countries. Furthermore, a cross-sectional observational study does not allow for establishing causal relationships between using securement devices and clinical outcomes. Another potential limitation is related to the voluntary participation of nurses, which could create selection bias, as it may have attracted greater participation from critical care nurses who are more interested or informed on the subject. The absence of long-term follow-up further limits the ability to observe the evolution of critical care nurses' knowledge and practices and the real impact of securement devices on clinical outcomes. The limited availability of these devices in the examined units may have also influenced the critical care nurses' ability to apply acquired knowledge, with potential repercussions on the study's results.

Implications for clinical practice and future research

The results of this study have important implications for clinical practice and future research. The limited availability and use of external securement devices for UC in intensive care units highlight the need for targeted interventions to improve the quality of care. Critical care nurse education is a crucial factor: investing in specific training programs on external securement devices could increase awareness of the benefits of such devices and promote their broader and more consistent adoption. This approach could reduce the incidence of complications such as infections, device dislocation, and erosion of the urethral meatus, thereby improving patient comfort.

It is also essential to investigate the comparative effectiveness of different securement devices further, mainly through studies that can provide more robust data. Additionally, it is necessary to explore the economic impact of the widespread implementation of such devices, evaluating the cost-benefit ratio concerning complications. Finally, future research could explore implementing standardized guidelines for external securement devices, considering the specificities of different types of patients and units, to optimize care and ensure better clinical outcomes.

Conclusions

Almost all critical care nurses interviewed have an excellent basic knowledge of the subject, but less than half have the opportunity to implement and apply their knowledge, as these devices are not available in most of the units. A spontaneous question arises: "Why is the opportunity to apply this knowledge not provided?" These devices should be supplied in all units to improve patient care. In most of the units where securement devices are available, the most utilized devices are StatLock systems, indicating that, while there is still a small number of respondents using outdated methods (standard tape and elastic bands), it is important to note that the use of recent, study-supported devices that ensure better patient outcomes has also been recorded.[15]

Despite basic knowledge on the subject, most respondents stated that they had never attended training courses on the matter. Lack of training leads to a decreased awareness of the benefits of this practice and does not encourage the use or request for these devices by nursing staff in their units. If these devices are to be implemented, investment in training is necessary, explaining the importance and benefits they bring to patients, thus encouraging their use.

Regarding outcomes, a difference in knowledge was recorded between the groups of critical care nurses who use/are familiar with securement devices and those who do not use/are not familiar with them, demonstrating that if nursing staff had the opportunity to use these devices, they would also gain more excellent knowledge of the improvements they bring to patient outcomes. This study has partially demonstrated the need to invest both in training courses and in providing the best available devices to all hospital settings so that the skills of each critical care nurse can be put into practice with the ultimate goal of ensuring and providing the best possible care for patients.

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Informed consent: all patients participating in this study signed a written informed consent form for participating in this study.

Patient consent for publication: all nurses involved in the study were provided with a detailed explanation of the nature of the research and voluntarily agreed to participate, giving their informed consent both for participation in the study and for the publication of anonymized information, in full compliance with ethical and legal standards.

Availability of data and materials: all data generated or analyzed during this study are included in this published article

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