Coping Styles of Patients Hospitalized in an Intermediate Trauma Unit

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Objective: Effective coping with the physical and mental changes experienced after traumatic injury decreases stress, reduces complications, and promotes healing. Although there are many studies of coping in medical patients, there is little research concerning the coping styles of patients hospitalized in trauma units. This study aimed to achieve two main objectives: (1) adapt the *Vignette Similarity Rating Method* for implementation in a Puerto Rican trauma unit, and (2) describe the coping styles of patients admitted to the unit, exploring their association with sociodemographic, clinical, and situational factors.

Methods: Patients hospitalized in a trauma unit were recruited. Nine patients participated in the adaptation process (33% women, 67% men; mean age 37.75), while in the coping assessment phase 43 patients were included (41.9% women, 58.1% men; mean age 39.5). The culturally and contextually adapted *Vignette Similarity Rating Method* was employed to depict and evaluate coping strategies. Associations between two adaptive coping styles, three less adaptive coping styles, sociodemographic and clinical characteristics of the participants, and length of hospital stay were determined.

Results: Participants reported a higher level of similarity with adaptive coping vignettes (median=18.0), followed by active coping vignettes (median=14.0). Individuals living with diabetes (p = .006) and those experiencing longer hospital stays (p = .018) reported a greater similarity to less effective Type A coping vignettes.

Conclusion: These findings emphasize the importance of considering the effectiveness of coping styles within specific contexts and to developing interventions that promote adaptive coping strategies, especially for patients facing prolonged hospitalization.

[P R Health Sci J 2025;44(1):32-38]

Key words: Coping, Coping styles, Trauma, Behavioral Medicine, Assessment

Traumatic injuries claim the lives of over 180,000 individuals annually, amounting to approximately one death every three minutes (1). In Puerto Rico, violence and injuries such as accidents and homicides are amongst the top 6 leading causes of death in people under 75 years of age (2). Although violence and traumatic injuries result in numerous fatalities globally and locally, there is a substantial population of survivors who endure the aftermath. These survivors confront long-term health complications and face significant emotional burdens such as elevated risk for depression, post-traumatic stress disorder (PTSD), anxiety, and substance abuse (3-4).

The Puerto Rico Medical Services Administration (ASEM) Trauma Hospital is the main referral center for patients with serious traumatic injuries in Puerto Rico. As the only trauma hospital on the island, ASEM serves all regions and is equipped to handle complex and severe trauma cases, such as car accidents, falls, gunshot wounds, and other serious injuries. ASEM's specialized units (i.e., stabilizing, critical care, and intermediate trauma) provide care to patients who have suffered injuries that require complex surgical interventions and prolonged treatments.

The population served at ASEM is diverse in terms of age, gender, and type of injuries. Patients include both young individuals involved in vehicle and motorcycle accidents, as well as older people who suffer falls or trauma from other causes. Given the severity of these injuries, hospital stays are often prolonged, and many patients face both physical and psychological complications during the recovery process. This makes comprehensive management, including assessment of coping styles and adaptation to post-trauma circumstances, essential to improve patients' clinical and emotional outcomes.

Research conducted over several decades and across various multidisciplinary fields has consistently demonstrated that successful adaptation to stress and employing effective coping strategies lead to improved health outcomes. Coping styles are enduring patterns of reaction, akin to traits, that can be observed and measured across multiple mental and biological systems (e.g., cognitive, emotional, behavioral, and physiological). These reactions enable us to adapt to changing internal and environmental conditions, including stressors such as traumatic injury, and to maintain or restore homeostasis and overall well-being (5-6).

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The authors have no conflict of interest to disclose.

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Coping responses, such as identifying the stressor, actively seeking information, changing, or reframing thinking about the stressor, appropriately recognizing and communicating about physical and emotional symptoms, and utilizing spiritual and/or other social support, have proven to promote healing and exert a positive influence on overall health and disease outcomes (5-7).

Less effective coping strategies, often associated with more unfavorable disease course/outcome and slower recovery from injury, frequently involve avoidance behaviors such as substance abuse, isolation, denial, and/or inappropriate expression of emotion (5-9). Such ineffective coping has been linked to poor surgical outcomes (10). Furthermore, well-established evidence indicates that psychosocial distress which can be manifested as anxiety, stress, depression, and hostility may impact coping, and can adversely affect the course of disease (9,11).

Although research suggests that accounting for coping variables leads to more accurate predictions of health outcomes (12), there is little research on coping responses and/or styles of patients hospitalized in trauma units after unexpected injuries. Previous studies that primarily focused on characterizing the coping styles in patients diagnosed with chronic diseases such as HIV and cancer highlight the association between ingrained patterns of maladaptive coping and disease progression, negative prognostic indicators, and immune mechanisms linked to disease progression (5, 12-16). To our knowledge, the present study represents the first examination of coping styles within an understudied population, in the context of acute traumatic injury.

One notable aspect of this study is the utilization of an innovative and potentially more valid and flexible method for assessing coping styles. Traditionally, behavioral medicine research has relied mainly on self-report instruments to measure coping, which can be influenced by various biases, including social desirability. Additionally, these instruments assume that individuals are consciously aware of and accurately report their underlying emotions and the true reasons behind their actions, using standardized Likert scales that may not hold the same meaning for everyone. To achieve a more accurate assessment of coping styles that are hypothesized to impact the course and outcome of injury and disease, assessment methods beyond self-report are recommended (5,12,15-18).

Therefore, this study adopted an alternative assessment technique, the *Vignette Similarity Rating Method* (VSRM). The VSRM was developed to assess complex and challenging-to-measure coping styles or patterns in response to stress (12,17,18). The study focused on measuring five distinct styles, including; (1) *adaptive coping*, selecting thoughts and behaviors from a wide repertoire that effectively address the problem and reduce stress; (2) *active coping*, seeking information and taking control of one's situation; (3) *avoidant coping*, attempting to avoid thinking about or confronting a problem; (4) *Type A coping*, reacting to situations with hostility, impatience, aggression, control, and criticism toward others; and (5) *Type C coping*, decreased recognition and expression of needs, internal stress, emotions (especially so-called negative emotions), or physical sensations such as pain. Type C copers tend to focus more on others' needs and strive to please them, often struggling to acknowledge their own needs and emotions. As a result, they typically have limited ability to report their coping tendencies or emotions reliably on traditional self-report measures (19,20). The VSRM has been used in diverse populations in San Francisco, Baltimore, Rome, and Mumbai, India, to assess the influence of Type C coping on disease progression in persons with HIV/AIDS and cancer, demonstrating high face, construct, and predictive validity, as well as strong test-retest reliability (5,12,15-18).

By applying analogous logic, the VSRM can also be expected to assess the type A behavior pattern (TABP) with improved validity. Originally, the TABP was identified as a significant risk factor for coronary heart disease by the structured interview method (21). However, when self-report methods were used, which focused on less critical but more readily reported components of the construct, no causal relationship was established (22). We propose that utilizing the VSRM to assess the TABP could address the valid criticisms of both the TABP construct and its previous assessment methods (22). By placing emphasis on the pattern of emotional expressiveness, particularly hostility and aggressiveness (23), the VSRM should, theoretically be better able to capture the essential elements that contribute to the predictive success of the structured interview. Furthermore, this approach would alleviate the laboriousness and standardization issues associated with the interview method.

The current study had two specific aims. First, in our Vignette Adaptation Phase, our aim was to translate and adapt existing vignettes, originally developed by Temoshok, (15-18) for a Spanish-speaking, inpatient trauma population. Secondly, in our Coping Assessment Phase, the aim was to characterize the coping styles of patients hospitalized in a local intermediate trauma unit by utilizing the newly adapted coping style vignettes. Additionally, we sought to explore any associations between patients' sociodemographic and clinical characteristics and their coping styles (i.e., adaptive, active, avoidant, Type A, and Type C coping). Our overarching goal was to gain a deeper understanding of the coping styles exhibited by patients hospitalized in a trauma unit following unexpected injuries. In so doing, we aimed to provide valuable insight into how to promote healing, address the high prevalence of problems that arise in the recovery process, and potentially reduce significant costs to our healthcare system.

Methods

Recruitment

This cross-sectional study consisted of two recruitment phases. Participants were recruited in October 2015 for the Vignette Adaptation Phase, while recruitment took place between November 2015 and January 2016 for the Coping Assessment Phase. All participants were patients hospitalized in the Intermediate Trauma Unit at ASEM during the time of the study. Patients from this unit were specifically selected as we understood the magnitude of injuries and the level of care required in this unit would still allow participants to engage in our study. Considering that patients in other units (ex., critical care) are often physically incapacitated or mentally altered, would make them unable to provide informed consent or complete the necessary assessment tools for this study. The intermediate care unit then, allowed us to access a population that, while still experiencing significant trauma,

retained sufficient cognitive and physical capacity to actively participate in the research. To recruit participants for both phases, the first author approached potential participants at bedside during their hospital stay to obtain informed written consent. The study received approval from the University of Puerto Rico Institutional Review Board (Protocol # A3910115).

Participants

Potential participants for both phases were excluded if they met any of the following criteria: (1) under the age of 21, (2) unable to provide informed consent or complete the interview due to language barriers, physical limitations, medical conditions, or mental incapacity (e.g., intubation, severe pain, neurological impairment, psychosis, intellectual disability, dementia or other significant cognitive impairment), (3) patients in airborne isolation, and (4) prisoners. It is important to note that patients who took part in the adaptation phase were not included in the coping assessment phase.

Vignette Adaptation

A total of 11 participants were recruited for this phase of the study. Two patients declined to participate, resulting in a sample of 9 participants between 22 and 69 years (mean age = 37.75). (Table 1). The two patients who declined mentioned a lack of interest as their reason for not participating.

Coping Assessment

A total of 56 participants were recruited for this phase of the study. Thirteen patients declined to participate, resulting in a sample of 43 participants between the ages of 21 and 80 years (mean age = 39.49; SD = 2.62). (Table 1). The reasons given for refusing participation included: not interested (4), did not want to sign the consent form (1), did not meet age criterion (3), denied access to medical record review (3), felt that the study did not adhere to their religious beliefs (1), and required the presence of family member prior to agreeing (1).

Data Collection

Vignette Adaptation

Prior to identifying possible participants, researchers translated and adapted a total of 10 vignettes (2 per coping style), which had been used previously in outpatient medical settings treating patients with malignant melanoma or HIV/AIDS (5,12,15-18). The qualitative analysis was conducted using an iterative approach. The process began by translating vignettes from English to Spanish by a fully bilingual team. Content was then adapted for the Puerto Rican culture and medical context by adapting scenarios from outpatient medical settings to trauma related situations known to have occurred in our population. The process was followed by a consultation between the first author and a trauma specialist to gain additional insights into common medical scenarios within the trauma care environment. This collaboration provided critical contextual feedback, which informed the initial drafting of the vignettes.

Upon finalization of vignettes, the first author identified potential participants by reviewing the census for new admissions daily, including weekends. Potential participants were approached at bedside and explained the scope of the project. During the initial contact, inclusion criteria and study procedures were discussed. Eligible participants signed informed consent and completed a semi-structured sociodemographic interview. To determine whether our local participants could relate to the scenarios presented, the researcher read the 10 internally revised vignettes out loud to participants. These participants were then asked to provide feedback on how relatable the scenarios were to their personal experiences. This feedback was carefully documented and analyzed to identify aspects of the vignettes that required revision to improve their relevance and cultural sensitivity.

This iterative feedback process allowed for continuous refinement of the vignettes, ensuring that they accurately reflected the lived experiences and sociocultural context of the trauma patients. The patient feedback was systematically incorporated to enhance the vignettes' applicability and resonance with the target population.

Table 1. Study Participants

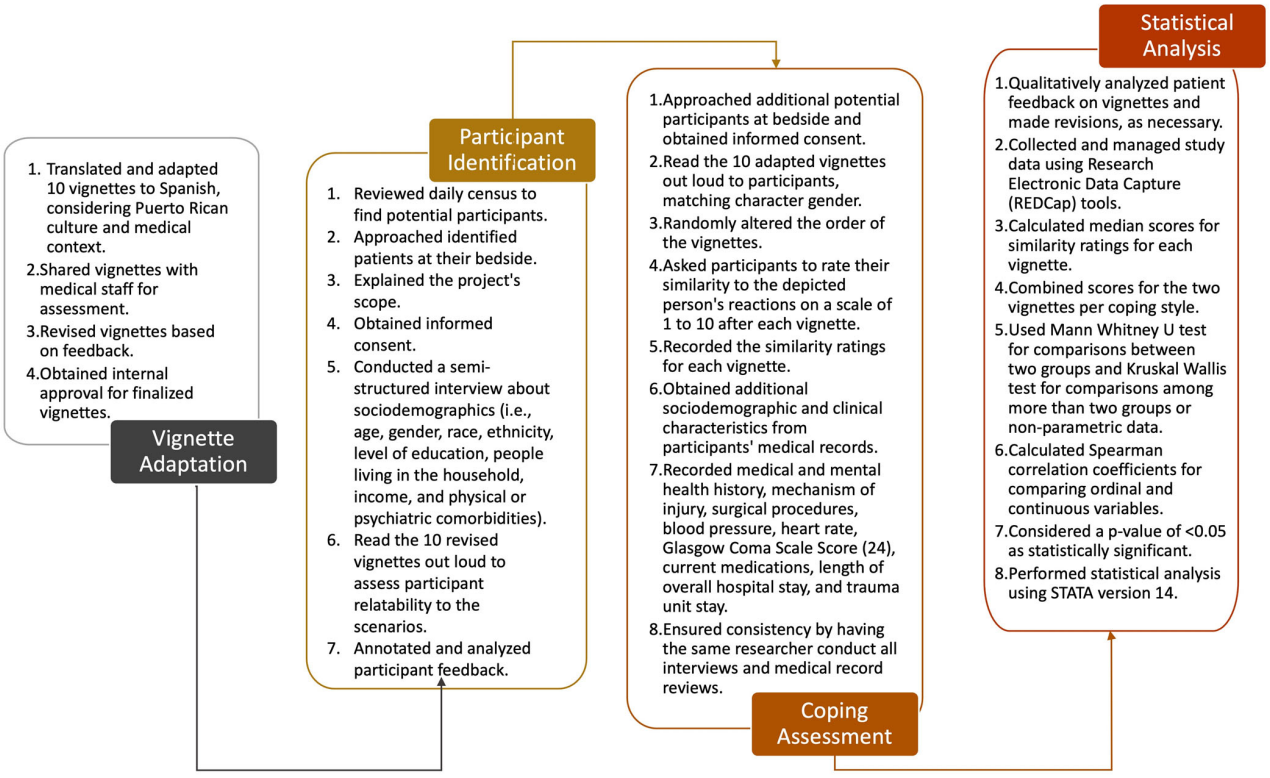
Vignette Adaptation Phase	**Total Participants n = 9**
Mean age	37.75
Gender	
Male	6 (67%)
Female	3 (33%)
Coping Assessment Phase	**Total Participants n = 43**
Mean age	39.49
Gender	
Male	25 (58.1%)
Female	18 (41.9%)

Coping Assessment

After the adaptation process, the first author approached additional potential participants at bedside to explain the scope of the second phase of the study and obtain informed consent. The 10 newly adapted vignettes were read out loud to consenting participants. The gender of the character in the vignette was matched to the gender of the participant, and vignette order was altered randomly. After reading each vignette out loud, the first author asked the participant to rate *"How similar do you think your reactions are to (person in the vignette)?"* on a scale of 1 to 10, ranging from "very different from me" to "very similar to me." Following the established VSRM scoring method and interpretation (16-18), higher ratings (i.e., of more similarity) were considered to indicate how much the participant identified with a specific coping style.

Additional sociodemographic and clinical characteristics were obtained by reviewing participants' medical records. All potential participants for both phases of the study were approached and interviewed by the same researcher to ensure consistency. The same researcher also completed all medical record reviews. (Figure 1).

Figure 1. Data collection and Anaysis



Statistical Analysis

For the Vignette Adaption Phase, the research team conducted qualitatively analysis of patient feedback and revisions were made accordingly. For the Coping Assessment Phase, study data was collected and managed using Research Electronic Data Capture (REDCap) tools hosted at the University of Puerto Rico, Medical Sciences Campus. REDCap is a *secure web application for building and managing online surveys and databases* (24).

Median scores for similarity ratings for each vignette were calculated. The scores of each vignette per coping style were added to compute a combined score. The Mann Whitney U test was used to compare two groups, and Kruskal Wallis was used when comparisons were made between more than two groups and when data were non-parametric. Spearman correlation coefficients were calculated for comparing ordinal and continuous variables (e.g., length of stay). A *p*-value of < 0.05 was considered statistically significant. Statistical analyzes were done in STATA version 14.

Results

Vignette Adaptation

For participants in the Vignette Adaptation Phase, the most common cause for admission was gunshot wounds (44%), followed by falls (23%) stab wounds, blunt traumatic injury, and surgical reasons (11%) (Table 2). Overall, patients demonstrated engagement in the process and expressed appreciation for being recruited, regardless of their reason for admission. Participants provided valuable feedback, suggesting the need to shorten the vignettes by one or two sentences to

Table 2. Participant Mechanism of Injury

Vignette Adaptation Phase	**Total Participants n = 9**
Mechanism of Injury	
Gunshot Wound	4 (44%)
Falls	2 (23%)
Stab wound	1 (11%)
Blunt Traumatic Injury	1 (11%)
Surgical Reasons	1 (11%)
Coping Assessment Phase	**Total Participants n = 43**
Mechanism of Injury	
Motor Vehicle Collision	17 (40%)
Falls	7 (16%)
Gunshot Wounds	6 (14%)
Burn	3 (7%)
Pedestrian	3 (7%)
Motorcycle Collision	2 (5%)
Stab Wound	1 (2%)
Missing	4 (9%)

maintain attention, particularly because the vignettes were being read out loud. In addition, participants recommended that we avoid being too specific with regards to treatment and procedures highlighted in the scenarios. For example, one vignette referred to a patient having a tracheotomy. It appeared difficult for some participants to relate to this scenario when they had not experienced this procedure. Likewise, certain scenarios initially focused on workplace-related concerns, which some patients also found difficult to relate to. Based on their input, these vignettes were revised to emphasize family-centered concerns, which resonated more with the patient population. While not all patients were employed, the majority commented on the impact of hospitalization on their family and household vs. their jobs (Figure 2). Lastly, patients confirmed their use of electronic devices during their hospital stay. Therefore, vignettes that depicted the use of the Internet to implement an active coping style were kept. All other vignettes were revised accordingly. Administration time for the adaptation phase varied between 20 to 60 minutes, depending on patients' level of engagement and medical staff interruptions for necessary patient care.

Figure 2. Example of Vignette Revision

Initial Vignette	Revised Vignette
Example 1: Susie/Nelson Type C Coping Style Vignette "After the accident, Susie/Nelson thought a lot about the recovery time and how this would be an inconvenience for his/her boss who had to take care of everything while he/she was away. When he/she found out he/she had months of recovery ahead and could not return to work for 6-8 months, he/she decided not to think about it and just accept it as fate. He/she also had a lot of questions but thought the doctor had more important cases to see. Susie/Nelson kept a cheerful attitude and tried not to complain. He/she did not want to burden the people around them. After all, everybody had their own problems to take care of.	*Example 1: Susie/Nelson Type C Coping Style Vignette* "After the accident, Susie/Nelson thought a lot about the recovery time and how this would be an inconvenience for his/her family who had to take care of everything while he/she was away. When he/she found out he/she had months of recovery ahead and could not return to work for 6-8 months, he/she decided not to think about it and just accept it as fate. He/she also had a lot of questions but thought the doctor had more important cases to see. Susie/Nelson kept a cheerful attitude and tried not to complain. He/she did not want to burden the people around them. After all, everybody had their own problems to take care of.

Coping Assessment

The most common mechanism of injury in our sample was motor vehicle collision (67%), followed by falls (16%), and gunshot wounds (14%) (Table 2). There were no demographic differences between mechanisms of injury. Study participants rated themselves as more similar to vignette characters who had adaptive coping styles (selecting particular thoughts and behaviors from a wide repertoire to decrease stress, median=18.0), followed by active coping (seeking information to take control of their situation, median=14.0). There were no significant correlations between participants' sociodemographic characteristics and coping styles (p >.05), nor between mechanism of injury and coping styles (p >.05). Patients who reported living with diabetes, however, rated their reactions as more similar to those of vignette characters who depicted strong Type A coping (p = .006). Likewise, increased overall length of stay in the hospital (p = .015) (Table 3) and increased length of stay in the intermediate trauma unit (p = .018) (Table 4) were significantly associated with high similarity ratings to characters who reacted with a strong Type A coping style.

Discussion

This study was the first to use the *Vignette Similarity Rating Method* with a Hispanic/Latino population hospitalized in a trauma unit. The adaptation process completed suggested that participants were engaged with this assessment method, which theoretically, should increase the validity of their responses (5, 16-18). This contrasts to respondents' typical complaints about self-report questionnaires, where they often feel forced into response options that don't fit their experiences or individuality. Thus, we expect that participants' openness and receptivity to the VSRM in this study holds significant promise for the expansion of such methodology to future studies with diverse populations and medical settings.

Our second aim was to explore associations between coping style and sociodemographic and/or clinical characteristics in this trauma unit sample. The relationship between trauma and coping styles could be influenced by a combination of situational/contextual factors, personality-based factors such as resiliency, psychological characteristics, and medical comorbidities, as well as the mechanism and extent of injury (8,9,11,25,26). Most participants viewed themselves as similar to vignette characters who used adaptive and active coping styles (theoretically, the two most effective coping styles) to deal with trauma situations during their hospital stay, which has positive healing and recovery implications for these patients.

Table 3. Overall Length of Stay and Coping Style

Coping Style	Correlation Coeff	*p*-value
Adaptive	-.223	.151
Active	.176	.260
Avoidant	-.075	.631
Type A	.368	.015*
Type C	.138	.378

Table 4. Length of Stay in the Intermediate Trauma Unit and Coping Style

Coping Style	Correlation Coeff	*p*-value
Adaptive	-.100	.534
Active	.090	.574
Avoidant	.005	.974
Type A	.367	.018*
Type C	.153	.339

Although we expected to see significant correlations between the mechanism of injury and coping style, our findings did not support our initial hypothesis, possibly due to our limited sample size. Further investigation could help us determine whether there is a relationship between mechanism of injury and length of stay and/or between mechanism of injury and coping style.

Interestingly, participants with self-reported diabetes were more likely to relate to vignette characters with strong Type A coping. Possible explanations, consistent with reports in the literature, may be that patients with uncontrolled glucose levels may have increased emotional reactivity to daily stress, and can experience significant mood changes, including sadness and irritability (27-29). However, our study, did not include glucose monitoring, so we are unable to relate the patients' proclivity to identify with Type A behaviors and emotions (e.g., hostility, impatience) to changes in glucose levels.

As for our findings regarding the association of length of hospital stay with the use of less adaptive Type A coping, there are several possible explanations. A person's coping repertoire could become less adaptive over time when challenged with the significant stressor of an extended hospital stay. It is also possible that having a strong Type A coping style contributes to longer hospital stays, for a variety of reasons (e.g., the Type A tendency to control and criticize others creates unnecessary friction and stress with medical staff when it is more adaptive to adhere to nursing schedules and doctors' orders). Whatever the causal direction of the association, a case could be made to include coping style assessment as part of patients' medical intake, as well as follow-up assessments to ascertain any changes in coping style over time, and to develop culturally appropriate interventions that might help cultivate and sustain more adaptive coping styles in patients who face or who are undergoing prolonged hospitalizations.

Regarding the study's limitations, it is important to recognize that this is a pilot study with a limited sample; therefore, we can only report preliminary data. In addition, the Intermediate Trauma Unit of ASEM receives the most severe cases; thus, our results may not be generalizable to other hospitals and medical settings. It is also important to note that the study focused on primary injury on date of admission and did not gather data on whether subjects had suffered poly-traumatism. Therefore, we are unable to generalize results to this population.

Overall, our findings highlight the importance of addressing trauma patients' coping styles. A better understanding of coping styles and their relative effectiveness can provide the foundation for developing intervention models that encourage more adaptive coping in trauma patients. For example, patients with a Type A coping style, which has been associated with worse outcomes for cardiovascular disease and hypertension (21-23) may be offered cognitive behavioral interventions including relaxation, visualization techniques or mindfulness to manage more effectively the multiple and often uncontrollable stressors inherent in a trauma unit. Encouraging more adaptive behaviors such as better cooperation with treatment and better relationships/ partnerships with nursing and medical staff can increase patients' chances for survival and recovery after a life-threatening injury. In addition, developing and maintaining more adaptive coping styles may help reduce recidivism and translate into lower overall costs for our healthcare system.

Resumen

Objetivos: Manejar la secuela emocional de una lesión traumática disminuye el estrés, reduce las complicaciones médicas y promueve la recuperación. Hay poca investigación sobre los estilos de afrontamiento de pacientes hospitalizados en unidades de trauma. Este estudio propuso: (1) adaptar el "Método de calificación de similitud de viñetas: VSRM" para su uso en una unidad de trauma de Puerto Rico, y (2) describir los estilos de afrontamiento de los pacientes hospitalizados en la unidad y cómo se relacionan con factores sociodemográficos, clínicos y situacionales. Métodos: Reclutamos pacientes durante su estancia hospitalaria en la unidad de trauma. Participaron 9 (33 % mujeres, 67 % hombres; edad media 37.75) en la fase de adapatación y 43 (41.9 % mujeres, 58.1 % hombres; edad media 39.5) en la de evaluación de afrontamiento. El VSRM se adaptó cultural y contextualmente. Se analizaron las asociaciones entre 2 estilos de afrontamiento adaptativos y 3 menos adaptativos, considerando las características sociodemográficas y clínicas de los participantes y la duración de la estancia hospitalaria. Resultados: Los participantes reportaron identificación con las viñetas de afrontamiento adaptativo (mediana = 18.0), seguidas de las viñetas de afrontamiento activo (mediana = 14.0). Aquellos que reportaron vivir con diabetes (p = .006) y estadías hospitalarias más prolongadas (p = .018) respaldaron mayor similitud con las viñetas de afrontamiento tipo A. Conclusión: Estos hallazgos resaltan la necesidad de considerar la efectividad de los estilos de afrontamiento de los pacientes para desarrollar intervenciones que fomenten un afrontamiento adaptativo, particularmente en pacientes que enfrentan estadías prolongadas.

Acknowledgments

The authors would like to acknowledge Giselle Alicea, PhD for her assistance with data collection. This project was partially supported by The National Institutes of Health: Award Number HCTRECD R25MD007607 from the National Institute on Minority Health and Health Disparities. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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