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Title: Patient health literacy affects outcomes after major trauma
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Clinical Scenario

Paramedics respond to a 50-year-old male at 3am in Runaway Bay, complaining of a 5-day history of general malaise. The patient is found seated in bed, GCS-13 (E3V4M6) febrile and diaphoretic. Paramedics identify severe infection to the patients right leg, for which the patient received surgery 4-weeks ago following a traumatic tibial shaft fracture. The patients wife explains her husband has been non-compliant with his trauma care plan, has missed 2 follow-up appointments and ran out of antibiotics 2-weeks ago. The patient meets sepsis criteria and is treated and transported accordingly.

PICO

Following a major trauma incident in the adult population, does poor health literacy negatively affect trauma patient outcomes?

Research Rationale

The Australia New Zealand Trauma Registry identified 8,585 patients hospitalised within their designated trauma facilities, between 2018-19 (Australia New Zealand Trauma Registry, 2020). As trauma care becomes more complicated, a patients ability to comprehend and understand their requirements for management following discharge becomes increasingly important (Hall et al., 2018). This poses significant risk in increasing the burden on the healthcare system, including the use of pre-hospital paramedics.

Search Strategy

Three databases were used to identify published articles relevant for this review. Embase, MEDLINE (Ovid interface), and CINAHL (EBSCOhost interface) were searched on September 3rd, 2021 using the following Medical Subject Headings (MeSH) and keyword search: ("Major Trauma*" or Trauma* or "trauma management*" or "Trauma incident*") AND ("health literacy*" or "health understanding*"). The inclusion of key words such as pre-hospital, paramedic, ambulance etc. yielded zero suitable results and were subsequently removed from the search strategy. Articles were included where the title and/or abstract discussed trauma patients and their level of health literacy. Articles were excluded if they were published before 2016, full text articles inaccessible, were not specific to trauma patients alone or provided irrelevant results, or included case studies/reports, commentary, or editorials. Results were limited to English articles and that enrolled human participants.

Search Results

The search identified 419 articles, with an initial 31 articles meeting the inclusion criteria. Of these, 25 were excluded due to meeting one or more of the exclusion criteria with 6 articles deemed suitable for full-text evaluation. The search results and selection process is outlined in Diagram 1, and a summary of selected articles for appraisal is provided in Table 1.

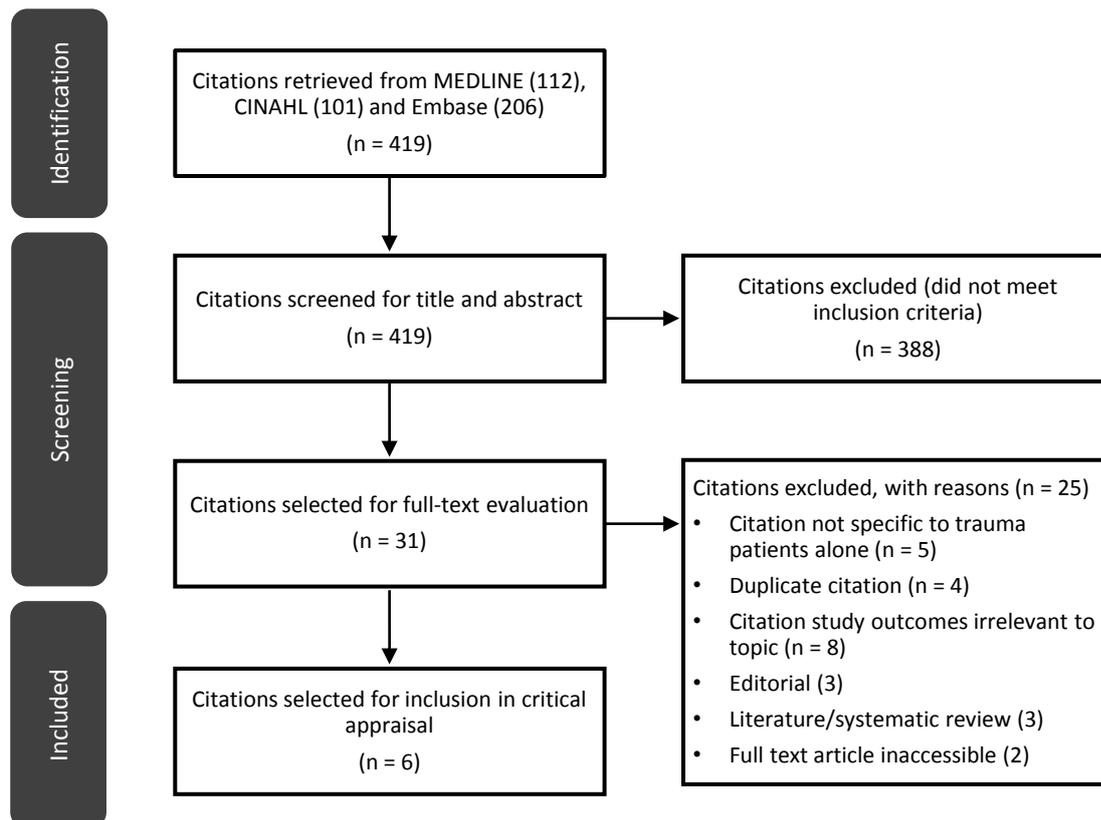


Diagram 1. PRISMA diagram identifying article selection process.

Table 1: Study results and analysis of included studies

| AUTHOR, DATE | POPULATION | DESIGN | OUTCOME | KEY FINDINGS | STRENGTHS AND WEAKNESSES |
|-------------------------------|--|-------------------------------|--|---|--|
| <i>(Cosic et al., 2017)</i> | 190 trauma patients with operatively managed lower limb fractures agreed to participate in the survey. | Pre-post interventional study | To determine the level of HL in this population and the effect on HL after a pre-discharge discussion on the injury and ongoing management | <ul style="list-style-type: none"> • Orthopaedic trauma patients receiving usual cares displayed poor HL. • Implementing pre-discharge discussions on patient injury and management lead to a substantial improvement in HL. • Lower HL was found in older patient groups or those with lower levels of education. | <p>Strengths:</p> <ul style="list-style-type: none"> • Large participation rates in randomized controlled study. • Rigorous and justifiable inclusion criteria and exclusion criteria. <p>Weaknesses:</p> <ul style="list-style-type: none"> • All patients in this trial had ISS <15 and were not classified as major trauma. • Does not evaluate/follow up on patient adherence to discharge orders. • Non-English-speaking patients were excluded. |
| <i>(DeMario et al., 2021)</i> | 50 Adult inpatients over 18-years-old that were admitted to the level 1 trauma service, with a greater than 2 day length of stay | Prospective Study | To determine the HL of the population and identify their ability to comprehend their injuries and ongoing management | <ul style="list-style-type: none"> • 32% of patients were unable to correctly identify 50% or more of their injuries. • 74% of patients indicated marginal or inadequate HL. • The study found that the patient's ability to identify their injuries or care teams, had no association to their self-reported HL. | <p>Strengths:</p> <ul style="list-style-type: none"> • Contemporary and validated HL assessment tools used to survey patients. • Researchers conducting survey with patients were blinded to patient injuries/charts <p>Weaknesses:</p> <ul style="list-style-type: none"> • Small study size of 50 participants at a single facility. • Nursing staff were used to identify suitable candidates for participation in the survey • Non-English-speaking patients were excluded. |

| | | | | | |
|------------------------------|--|--------------------------------------|---|--|---|
| <i>(Shahan et al., 2016)</i> | 35 trauma patients participated in this survey, and were identified when attending their first follow up visit to a trauma clinic following discharge, over a 6-month period | Therapeutic/care management level IV | To determine level of comprehension amongst trauma patients on their injuries, as well as satisfaction levels of care received. | <ul style="list-style-type: none"> • The survey found that 40% of patients were unable to recall the extent or type of injuries they sustained. • 54% were unable to correctly recall any operations they received as part of their cares. | <p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Treating physicians were blinded to survey had no knowledge of which patients were being surveyed prior to their follow-up appointment. • Surveys were provided prior to the patients first follow up appointment. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Small participant size and a short period of collection. • A low (level IV) level of evidence. • TBI patients were not included in this study. • No validated assessment tools. |
| <i>(Swartz et al., 2018)</i> | All patients over 18-years old admitted to a dedicated level 1 trauma service. The study included 140 patients, with patients excluded if they had altered mental status, history of dementia or not orientate to time, place, and date. | Prospective observational study | To identify factors that are associated with low HL and whether a relationship exists between HL and the health outcomes of trauma patients | <ul style="list-style-type: none"> • HL deficiency groups were significantly less likely to comply with discharge instructions and follow-up appointments. • HL deficiency groups had a higher incident rate of post-discharge ED visits. • Low HL groups had higher complications with longer periods of recovery; • Low HL groups were more likely to have lower injury recall • Demonstrated that one in every four trauma patients fell within the low HL group | <p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Patients provided with contemporary and validated HL assessment tools in preferred language. • Secondary outcome measure of 30-day re assessment of patient outcomes. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Single centred study therefore lacks diversity so lower generalizability. • A larger population size may lead to a more definitive conclusion. |

(Weinberg et al., 2019)

63 Patients 18-years or older who were admitted to a Level 1 trauma centre with traumatic injury, with a hospital length of stay of 2 days or more were included and accepted following consent

Prospective Study

To determine if a patients HL was associated with their ability to comprehend and follow discharge instructions following a trauma injury.

- Patients that were identified as deficient in HL were significantly less likely to understand and follow discharge information.
- HL deficient group was also more likely to rate their treatment experience poorly.
- Utilised NVS which was a measure of prose literacy (written word comprehension), numeracy, and document literacy (understanding and ability to interpret forms).

- The trauma aspect of HL measure was conducted under an unvalidated assessment tool.

Strengths:

- The use of a validate measure for HL assessment, the NVS assessment administered by a physician researcher.
- Screening of discharge information was followed up within 72-hours of patient discharge increasing generalisability.

Weaknesses:

- Categorising of patients HL was done via the admitting nurses without specific metric or tools for assessment.
- The follow up telephone conversations with patients was not a validated tool.
- Non-English-speaking patients were excluded.

Abbreviations: Health Literacy (HL), Next Vial Signs (NVS), Short Assessment of Health Literacy (SAHL), Traumatic Brain Injury (TBI), Injury Severity Score (ISS)

Comments

The literature suggests the trauma patient population is more likely to have lower levels of health literacy, and difficulties with comprehending and complying to discharge information (Cosic et al., 2017; DeMario et al., 2021; Swartz et al., 2018; Weinberg et al., 2019). The study by Swartz et al. (2018) found that this patient population were also less likely to attend follow up appointments and had a higher rate of pre-admission incidence in the lower HL groups. However, this was the only study that was able to report lower health literacy having a potentially adverse effect on the trauma patient outcome. While the study of Cosic et al. (2017) was able to identify a significant improvement in patient health literacy following a targeted discharge discussion, it provided for no measure on whether this subsequently improved the patients long-term outcomes.

Considerations

At present, the current research suggests that trauma patients should be considered an 'at risk' group of individuals that may have difficulty in comprehending and complying with discharge information. While these 6 studies do not identify the risks that poor health literacy poses to this specific population, there are multiple studies that conclude low health literacy in other high-risk populations significantly impact over-all health outcomes (Polster, 2015). Additional trials would assist in identifying the impacts that poor health literacy has on the trauma population, and their long-term outcomes. This is of particular importance for reducing the burden this population groups places on pre-hospital paramedic services.

Clinical Bottom

Patients with low health literacy are more at risk of not comprehending and being non-compliant to discharge information following a traumatic injury.

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