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Using Simulation to Test Validity and Reliability of I-BIDS: A New Handoff Tool

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Abstract

Background. Patient safety and improved outcomes are core priorities in healthcare, and effective handoffs are essential to these priorities. Validating handoff tools using simulation is a novel approach.

Methods. The construct validity and instrument reliability of the I-BIDS© tool were tested. In Phase I, construct validity was substantiated with a convenience sample of 21 healthcare providers through an electronic survey. Content Validity Ratio (CVR) was tabulated using Lawshe's CVR. Interrater reliability was tested in a simulated handoff scenario, in Phase II, with graduate nursing students and two raters, and simulation effectiveness was assessed by students.

Results. Construct validity was evaluated, and 17 of the 25 items were found significant at the critical level (0.42). Items scoring below were removed, and the tool was reduced by one category. Weighted kappa (Kw) with quadratic weights was run from the scenario data to determine if there was an agreement between raters of handoff performance. There was a statistically significant agreement between the two raters, Kw = .627 (95% CI: .549–.705), $p < .001$) with good strength of the agreement. SET-M Total mean was 55.64 ($SD = 2.46$).

Discussion. The tool showed beginning validity and interrater reliability. The SET-M Learning subscale showed the widest range of scores which suggests the most

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opportunity for improvement. Use of the tool in simulated scenarios may be one way to test the items further.

Conclusions. Simulation was effective in facilitating the evaluation of the tool.

Keywords
simulation, healthcare handoff, handoff tool, construct validity, instrument reliability

Background

Handoff, the transfer of valuable and relevant information from one individual or team to another, is recognized across disciplines and professions as a communication method of conveying vital information that requires preservation during the transfer (Health and Safety Executive, n.d.). The literature on the handoff process remains understudied, and the definition of handoff is intrinsically informed by the originating discipline or domain (Kulkarni, 2010). The operational purpose of handoff points is industry or field-specific and may not apply to different fields, settings, or disciplines (Kulkarni, 2010). Handoff in disciplines outside of healthcare identifies effective communication as an essential task when the transfer of information or responsibilities occurs between individuals or teams (Health and Safety Executive, n.d.). In manufacturing, for instance, information about materials, finished products, or processes is essential (Kulkarni, 2010). Similar handoff relevance is observed and expected in other industries or domains like telecommunications, information technology, engineering, and aerospace (Kulkarni, 2010). Healthcare is one industry where handoffs occur frequently and systematically and where specific and clear handoff points (i.e., communication) are essential to quality and safety (Patterson et al., 2004).

Communication errors contribute to sentinel events, like delays in treatment, and handoff failures (The Joint Commission, 2017). Research suggests that medical errors are included in the top three causes of mortality in the United States (Makary & Daniel, 2016). Data needs to be conveyed in a timely, clear, concise, and consistently structured manner (The American College of Obstetricians and Gynecologists, Committee on Patient Safety and Quality Improvement, 2012). Standardization of handoff procedures increases positive outcomes with patients and healthcare professionals (Eberhardt, 2014). A standardized approach is formulated when specific mnemonics are followed. Mnemonics help retain factual information (Conderman, 2020) and are an effective strategy for teaching (Maghy, 2015).

A review of literature related to handoffs, particularly in critical settings, reinforces the challenge that handoffs represent to healthcare systems. Efficiency and quality are communication factors that may affect outcomes (Hales et al., 2017). In addition to effective communication skills, studies support systematical handoffs to minimize errors and improve outcomes (i.e., patient and system outcomes) (Abraham et al., 2014a). Despite the supporting evidence, using available standardized tools, and a

systematic approach to handoffs, communication errors still occur. Improving systematization and standardization of patients' handoffs may be the first step to achieving a certain degree of uniformity in handovers (Abraham et al., 2014a). Also, expanding the depth and breadth of some domains in current tools like SBAR (Marshall et al., 2009) and I-PASS (Starmer et al., 2012) may enhance the transfer of information and reduce communication error.

Challenges in Clinical Settings and Tool Development

One way to prevent communication breakdown and decrease the incidence of preventable complications may be achieved by introducing improved standardized handoffs. Standardized handoff and feedback help interlocutors communicate using common terms in a systematic structure (Patton et al., 2017). For instance, standardization of handoff can decrease medication errors and improve users' satisfaction (Patton et al., 2017).

Communication in healthcare needs to be well-organized and operative (Agarwala & Lane-Fall, 2017; Leonard et al., 2004; Starmer et al., 2012). Handoff in critical settings, sometimes under duress, poses a challenge to the healthcare providers involved in providing and receiving such information. In these instances, effective communication skills facilitate passing information thoroughly and straightforwardly to minimize the potential omission of important information or errors. A barrier to the handoff of information, especially in critical circumstances, is how much verbal communication is remembered (Shertz, 2018). A brief report system may help to identify information that is critical and necessary to optimize the patient's outcome (Shertz, 2018).

Handoff ontology should address three essential characteristics: clarity, dependability, and efficiency (Abraham et al., 2014b; Greenberg et al., 2007). To satisfy these characteristics, a tool with specific domains and constructs is necessary. The criteria under these domains should accurately capture critical data on patients' conditions and improve medical handoff quality in different settings. A tool for handoff communication also should capture and deliver data thoroughly, concisely, and be generalizable to ensure that the handover is appropriately transferred and comprehended.

Currently, the available handoff tools for patient handover used in U.S. military medicine lack generalizability across military branches (SBIR.gov, n.d.). As a result, different military divisions adopted branch-specific tools to communicate handoff of patients (e.g., combat casualties). The absence of a uniformed way to deliver handoffs across branches generated the impetus for developing combat casualty handoff tools useful across different military branches (SBIR.gov, n.d.). Likewise, the potential use of the resulting handoff tool in other healthcare settings supports the efforts.

A tool was developed and structured to capture and deliver pertinent critical medical information, specifically in the military combat environment. The instrument was intended to be used in handoff training of military medical personnel (e.g., combat

medics) from different military branches (service-agnostic) and with future potential use in civilian scenarios of mass casualties or disasters.

Tool Components

Grounded in the reviewed literature on medical handoff instruments (Abraham et al., 2014b; Eberhardt, 2014; Patton et al., 2017), a handoff tool was developed to attain the critical medical information for an effective handoff by any healthcare personnel. The tool consists of five domains or sections: (Identification/Information, Background [situation], Illness Severity, Duties, and Synthesis [I-BIDS©]) (Guido-Sanz, 2018).

Domains. The domains of I-BIDS© (Guido-Sanz, 2018) are described below. The constructs (items) under each domain specify the amount of necessary clinical information to facilitate an effective and accurate handoff with essential pertinent clinical information. The organized capture of information by these constructs and its delivery during handoff assures the data's fidelity. The I-BIDS© tool was developed to facilitate the handoff of clinical information between providers at the same or different care points and to standardize the delivery of appropriate clinical information succinctly.

I. The Identification/Information (I) domain, about the person giving information (sender) and how the sender will correctly identify self, expands the information provided on the Identity domain of I-SBAR (Marshall et al., 2009).

B: The Background (situation) (B) domain, which reflects the information gathered through assessment of the patient, provides demographics and a general clinical introduction of the patient's medical condition and deficits. Current handoff tools, SBAR (Leonard et al., 2004), SBARR (Sabio & Petges, 2019), and I-PASS (Starmer et al., 2012) address this information in separate categories (Marshall et al., 2009).

I: The Illness Severity (I) domain reflects the most recent vital signs, a detailed description of injuries, and abnormal laboratory values (if available).

D: The Duties (D) domain discloses what has been done at the handoff time with detailed interventions for each injury and the patient's overall management. The D domain also reflects what needs to be done for each deficit [injury prioritization]) addressing duty by system and severity of the injury and introducing a suggested contingency plan for failing measures and outcomes.

S: Lastly, the Synthesis (S) domain provides the receivers an opportunity to reinstate the information obtained from the sender in detail and offers a chance to evaluate the received content and identify any missing information that may be detrimental to the care of the patient.

This domain expands the receiver's feedback in a more detailed fashion than on the I-PASS mnemonic (Starmer et al., 2012).

Methods

Purpose

The purpose of this study was to assess, in two phases, the content validity of the newly developed I-BIDS© Handoff Tool (Guido-Sanz, 2018) and test the instrument's reliability using simulation during Phase II. The effectiveness of the simulation was evaluated as part of Phase II. First, in Phase I, a group of participants evaluated the tool's items for discrimination of essential constructs (items) for each domain. Once the tool's construct validity was established, in Phase II, a simulation experience was designed and implemented to evaluate the tool's instrument reliability. Additionally, the study aimed to show the use of simulation in evaluating handoff tools for instrument reliability. Institutional Review Board (IRB) approval was obtained for all phases of the study.

Phase I Background and Results

A survey was developed and designed to assess the content validity of the I-BIDS© Handoff Tool (Guido-Sanz, 2018). Twenty-one participants met the inclusion criteria and were purposefully identified as experts in their clinical field, and they constituted the "Content Expert Evaluation Panel." The inclusion criteria included adults over the age of eighteen years, licensed nurses, nurse practitioners, physician assistants, and other advanced practice providers, including nursing faculty, who worked in the acute care and/or primary care setting for five or more years. "Exponential non-discriminative snowball sampling" (chain-referral sampling) (Lashley, 2018, p. 36) facilitated reaching the target population faster. Participants were recruited by personal email. The study was conducted using voluntary and confidential survey responses.

The survey took place online via a Qualtrics® (Provo, UT) link provided in an email. The link to the study was further shared with those known to participants that met the inclusion criteria. A consent form was the first screen seen on the survey page, and participants had to acknowledge this screen before advancing to the following screen. Participants were told that if they experienced any stress or anxiety completing the survey, they could stop at any time without consequences. Upon completing the study, the participants had no further obligation to remain in contact or be associated with the project. No personal identifiers were collected during or after recruitment. Participants' Email addresses were collected to distribute the survey but not linked to their responses.

Instruments. ***I-BIDS© Handoff Tool*** (Guido-Sanz, 2018): The validity survey in Phase I assessed each domains' items of the original tool (I-BIDS©) using a Likert scale of three points (1 = not necessary; 2 = useful but not essential; and 3 = essential) (Lawshe, 1975). Participants evaluated each item under the five tool's domains: (1) Identification/Information, (2) Background, (3) Illness Severity, (4) Duties, and (5) Synthesis (I-BIDS©) and considered them in those categories.

Statistical Analysis. **Construct Validity:** The construct validity of the tool was evaluated using Lawshe's (1975) Content Validity Ratio (CVR), and for each item, the CVR formula was tabulated. The final decision to retain an item was based on the CVR and the number of panel members that rated it essential. The minimum value of CVR for an item to be retained for a panel of 20 respondents was 0.42 (p = .05) (Lawshe, 1975).

Results. **Demographics:** A convenient sample (n = 21) of registered nurses (RNs) (47.6%; n = 10), nurse practitioners (NPs) (47.6%; n = 10), and a physician assistant (PA) (4.8%; n = 1) met the inclusion criteria. One participant (RN) answered only the survey's demographics portion and was eliminated from the sample for further analysis beyond demographics. The mean years of practice were 7 years (ranging from 1.5 to 24 years). Participants identified mostly as females (67%; n = 14), with a master's degree (52%; n = 11). The level of education of the participants also included four bachelor's degree-prepared professionals (19%; n = 4) and six doctoral-prepared participants (29%) (Doctor in Nursing Practice; n = 3; research doctorate [PhD]; n = 3). The practice setting of participants ranged from mostly intensive care units (ICUs) (67%; n = 14) to acute care settings (14%; n = 3), step down units (9.5%; n = 2), and primary care (9.5%; n = 2), caring mostly for adult patients (85%; n = 17), and the majority worked night shifts (45%; n = 9). ***I-BIDS***© (Guido-Sanz, 2018) ***CVR:*** CVRs, employing Lawshe's (1975) method, were calculated for each of the tool's 25 items (constructs). Only items ranked as essential were entered in the calculation. Items scored CVRs between 0.048 and 0.905. Seventeen items were significant at the critical level (0.42). Eight out of 25 items scored below the tool's critical level (−0.048 to 0.333). See Table 1. Items that were not significant at the critical level (.42) were removed. See Table 2.

Under the *Identification/Information* (*I*) domain, the name, role, and ranking of the personnel providing the handoff or stating to whom the reporting is given were not validated as essential and, therefore, removed. Items related to the nature of the injury and demographics were retained.

In the *Background* (*B*) domain, three items were not validated: blood type, assistive devices, route, and time of administration of medications, blood products, or intravenous fluids. Items related to an assessment by the system and expanding on information previously disclosed in the *I* domain remained. Likewise, under the *Duties* (*D*) domain, a timed, detailed account of interventions for each injury and the patient's overall management and the introduction of a contingency plan for failing constructs or outcomes were not deemed essential. Instead, items related to prioritization of care were. Lastly, the proposed detailed restatement from the receiver, under the *Synthesis* (*S*) domain, was appraised as unnecessary by almost half of the respondents.

The resulting tool (I-BID©) (Guido-Sanz, 2022) was reduced to four domains from five.

Table 1. Initial Content Validity Ratios (CVR) for the I-BIDS Tool.

General Item	n_e	Content Validity Ratio (*CVR*)
Item 1—Full documentation of all necessary data	16	0.524
Item 2—Name, role, rank	8	−0.238
Item 3—Reporting to	14	0.333
Item 4—Presenting (age, gender, injured pt.)	17	0.619
Item 5—In critical, non-critical condition	18	0.714
Item 6—Resulting from	20	0.905
Item 7—Needing transfer from	15	0.429
Item 8—Presenting (chief complaint) core problems	20	0.905
Item 9—Age, gender	15	0.429
Item 10—Allergies	20	0.905
Item 11—Blood type	8	−0.238
Item 12—Code status	18	0.714
Item 13—Nature of injury	19	0.81
Item 14—Mental status	19	0.81
Item 15—Assistive devices	14	0.333
Item 16—Presentation (by system)	16	0.524
Item 17—Receiving (ex. medications, IV fluids)	20	0.905
Item 18—Route/time of administration	14	0.333
Item 19—Vital signs	18	0.714
Item 20—Present details description of injuries	17	0.619
Item 21—Abnormal laboratory values	18	0.714
Item 22—What has been done	14	0.333
Item 23—Plan	16	0.524
Item 24—Introduce contingency plan	11	0.048
Item 25—Reinstate information	11	0.143

n_e: Number of panel members indicating construct was "essential." full tool can be accessed at https://stars.library.ucf.edu/nursing-tools/1

Discussion: Effective communication and critical medical information were captured in the five domains of the I-BIDS© tool. Moreover, the eight items deemed not useful were identified for removal, facilitating future iterations, and assessment of the tool. The resulting validated tool consists of 17 items distributed in four domains. This appraisal suggested the complete elimination of the *Synthesis* domain. We hypothesize that the items identified for removal were too granular in content, inappropriate in the context, or too cumbersome and lengthy for an accurate, effective, and concise handoff. Perhaps, domains with shorter items and or less depth and breadth would have been appraised differently. The revised tool was then used in Phase II. The rest of this manuscript will focus on Phase II, with limitations and future research for this Phase included at the end.

Table 2. Content Validity Ratios (CVR) for the Retained Items of the I-BIDS Tool.

General Item	n_e	Content Validity Ratio (*CVR*)
Item 1—Full documentation of all necessary data	16	0.524
Item 4—Presenting (age, gender, injured pt.)	17	0.619
Item 5—In critical, non-critical condition	18	0.714
Item 6—Resulting from	20	0.905
Item 7—Needing transfer from	15	0.429
Item 8—Presenting (chief complaint) core problems	20	0.905
Item 9—Age, gender	15	0.429
Item 10—Allergies	20	0.905
Item 12—Code status	18	0.714
Item 13—Nature of injury	19	0.81
Item 14—Mental status	19	0.81
Item 16—Presentation (by system)	16	0.524
Item 17—Receiving (e.g., medications, IV fluids)	20	0.905
Item 19—Vital signs	18	0.714
Item 20—Present details description of injuries	17	0.619
Item 21—Abnormal laboratory values	18	0.714
Item 23—Plan	16	0.524

n_e: Number of panel members indicating construct was "essential."

Phase II

Once the construct validity of the tool was established, the instrument reliability of the resulting tool (I-BID©) (Guido-Sanz, 2022) was tested using simulation.A convenient sample of two graduate nursing faculty subject matter experts (SMEs) served as raters. One rater was a recognized national and international simulation expert with the other having over 25 years of clinical expertise in acute/critical care and with practice experience in trauma, surgical, and disaster handoffs.

Research Questions: The handoff simulation scenario was designed to answer: (1) the instrument reliability of the tool and (2) whether participants found the simulation effective.

Sample/Inclusion and Exclusion Criteria: Inclusion criteria included a student group over the age of 18 years, registered in a course/lab within the graduate adult-gerontology acute care nurse practitioner (AGACNP) program.

Instruments. **Demographics:** These were gathered as part of a greater study looking at simulation within a specific program.

I-BIDS© Handoff Tool: The resulting validated tool (I-BID©) (Guido-Sanz, 2022) was tested for reliability using simulation. The tool consisted of a total of 17 items allocated in four domains or categories previously described.

***Simulation Effectiveness Tool-Modified (SET-M)*:** Permission was obtained to use. The tool consists of 19 items scored on a 3-point Likert scale and is administered after a simulation experience (Leighton et al., 2015). Items are ranked from "Do not agree," 1, to "Strongly agree," 3 (Leighton et al., 2015). The tool was useful for evaluating the participant's perception of the effectiveness of the simulation experience (Leighton et al., 2015). Simulation experiences can vary depending on the facilitator, and the SET-M ensures the integrity of the simulation effectiveness does not change with facilitators.

Procedure. The participating students completed instruments during their already scheduled simulation day. Participation in the simulations was part of the course/lab (graduate); however, participation in the study was voluntary. All participants were given the Explanation of Research.

Using simulation for handoff education and training improves handoff skills, knowledge, self-efficacy, and performance competency (Lee & Lim, 2021). As part of the course, students were taught about the I-BIDS© Handoff Tool (Guido-Sanz, 2018), and all participated in a handoff of a patient in a simulated scenario (either participating as the one handing off and/or the one receiving). The activities (learning about I-BIDS© Handoff Tool) lasted approximately 20–30 minutes. Although the learning activity was done on the I-BIDS Handoff Tool (Guido-Sanz, 2018), the focus was on the revised tool (I-BID) (Guido-Sanz, 2022). This occurred regardless of research.

***Simulation*:** Participating students were paired for the simulation. A facilitator provided a clinical scenario (vignette) to both participants. One participant assumed the sender role, and the other was the receiver. The sender provided the captured information following the I-BID© Handoff Tool (Guido-Sanz, 2018).

During the simulation where the I-BID© Handoff Tool was used (Guido-Sanz, 2022), two separate faculty raters observed and evaluated each part of the handoff using the I-BID© Handoff Tool. This was done either via live stream or via videotape of the experience.

Debrief. Participants completed the scenarios in pairs. The faculty member conducted a debrief immediately after each scenario with each participating pair of students. Once the faculty completed the review with all paired participants, a formal structured debrief followed. This structured debrief included all participants in attendance.

The structured debrief was done using the plus-delta approach (Klair, 2000). This approach was preferred for its simplicity, ease of implementation, and potential to promote self-assessment (Cheng et al., 2021). In addition, selecting a structured debrief ensures best practices (INACSL Standards Committee et al., 2021). A SET-M (Leighton et al., 2015) was completed by each participant after the formal structured debrief.

Statistical analysis. **Instrument Reliability and SET-M** Leighton et al. (2015)**:** The data were analyzed using IBM® SPSS® Statistics (Version 27) predictive analytics software (IBM Corp., 2020). The instrument interrater reliability was evaluated

using a weighted kappa for categorical data (Cohen, 1968). Weighted kappa (K_w) with quadratic weights (Fleiss & Cohen, 1973) was run to determine if there was an agreement between two NP faculty evaluations of six handoff performances rated on a 3-point scale of yes, partial, and no. The simulation effectiveness was evaluated using the SET-M by Leighton et al. (2015) after the simulation experience, and mean and standard deviations were reported.

Phase II

Demographics: Of the total number of participants (n = 12), 92% were female, Caucasian (75%), and ages 31–40 (58%). These percentages were rounded. The simulation experience participants were graduate AGACNP students.

Weighted kappa on I-BID© (Guido-Sanz, 2022). There was a statistically significant agreement between the two faculty, Kw = .627 (95% CI: .549–.705, $p < .001$).

SET-M (Leighton et al., 2015)**:** The study SET-M results were abstracted (n = 11; one did not submit valid responses). The SET-M total of the means were 55.64 (SD = 2.46). Subscales values were corrected for the number of items in the subscale. The Prebrief subscale (2 items) mean was 3.00 (SD = 0.00), the Learning subscale (6 items) 2.48 (SD = 0.32), the Confidence subscale (6 items) 2.98 (SD = 0.05), and the Debrief subscale (5 items) 2.98 (SD = 0.06).

Discussion. Interrater reliability of the instrument demonstrated a statistical significance agreement between raters. The strength of the agreement was classified as good according to Landis and Koch (1977). The SET-M (Leighton et al., 2015) Learning subscale showed the widest range of scores which suggests the most opportunity for knowledge gains and improvement. Using simulation to test psychometric properties on a handoff tool showed possibilities for further research. Continuing using the I-BID© Handoff Tool (Guido-Sanz, 2022) in simulated scenarios may yield further data on the tool items and on the possible uses of the tool across disciplines and the continuum of care. Also, further testing of the tool with military personnel may yield more meaningful feedback on relevance of the original intended use (military medicine) of I-BIDS©. Using simulation to test a handoff tool's reliability is a reasonable way to determine handoffs' measures' consistency.

Overall Discussion

Validation of assessment tools in healthcare is well documented (Urbina & Monks, 2021); however, little information on the use of simulation for testing psychometrics of handoff tools is available. From Phases I and II, the tool has beginning validity and interrater reliability.

Limitations and Suggestions for Further Future Research from Phases I and II

The two-part study posed limitations that warrant discussion and further exploration. **Phase I:** First, the convenience sample used for Phase I included only nurses and advanced practice providers. Current or past military engagement (e.g., medics) was not explored despite the tools being designed for military training. The decision to use clinicians (nurses and advanced practice providers) resulted from the constraints of engaging military personnel in research studies (Human Research Protection Office, 2021) and access to a convenient group of healthcare professionals experienced with handoffs.

The tool's items are constructs used by healthcare professionals where their years of experience and expertise were deemed appropriately qualified for validating this tool. In hindsight, in terms of delivery time, the items under each domain were probably too detailed and burdensome for delivery under certain circumstances (e.g., in combat under fire). Facilitating information transfer is essential to handoff quality and safe transfer of information (Manser et al., 2010). Lastly, eliminating the items contained under the Synthesis domain resulted in removing the domain itself. This may pose a barrier to effective communication with unknown outcomes.

Reiteration of received information or the acknowledgment of data remains a crucial component of effective communication. The importance of mutual understanding is supported by the literature. Shared understanding is an indicator of handoff quality (Manser et al., 2010). Perhaps, the tool's future design may include a more simplified synthesis of information by the receiver that should be explored and validated.

Phase II: Limitations of Phase II included the use of a small sample and its homogeneity. All simulation participants were NP students, at the same graduate nursing level. Whether these variables impacted the outcome of the simulation or not, certainly a larger and more diverse sample may yield more generalizable findings. Also, the potential impact of selecting a convenient sample of faculty members as raters on the participants' performance is unknown.

Future studies: Future research is necessary to assess any new iteration of the tool, including new and simpler constructs under the *Synthesis* domain. Also, testing this latest iteration of the instrument with military personnel may yield more meaningful feedback. Using this tool by the intended population will provide further data on the instrument's validity and generalizability.

Forthcoming studies exploring the use of this tool by nurses, healthcare and advanced practice providers, and nursing students from different education levels will provide more substantial information about the tool. Furthermore, testing the tool's use among military healthcare personnel from different branches of the uniformed services may help support and validate the instrument's service-generalizability intention. Research using simulated patients and simulation-based experiences may help to elucidate some of these concerns. Lastly, the unknown impact of faculty members as raters warrants further exploration. Using raters other than faculty may help elucidate this question.

Conclusion

Improvement in the communication of medical information is imperative. Standardization of medical handoff can be challenging. Informed from the existing literature, developing a new tool that aims to fulfill this need requires careful consideration of which essential information is needed to be shared by the conversers during handoff. In developing and testing I-BIDS© (Guido-Sanz, 2018), which was originally intended for handoff training of military medical personnel from different military branches (e.g., combat medics), thorough care was taken in building constructs that will reflect such crucial elements. Validating these constructs was critical to establish which ones were, in fact, fundamental during medical handoff to prevent detrimental outcomes resulting from miscommunication. Content experts from different disciplines and wide-ranging expertise in critical care evaluated the constructs. The resulting appraisal identified the tool's essential constructs and suggested eliminating those below the sample's established CVR (Lawshe, 1975). After eliminating eight constructs deemed unnecessary, the resulting tool consists of 17 constructs and four I-BID© (Guido-Sanz, 2022) domains.

Further research is needed to explore the resulting tool's generalizability. More importantly, additional studies are required to examine the tool's use in clinical situations and measure the resulting communication outcomes under different clinical scenarios and circumstances. This effort to minimize errors in communication that result in adverse effects on casualties may improve patient outcomes. It is not known, without further research, whether this tool may impact handoff communication as intended.

The additional testing of this tool, its translational and generalizability potential, may also be explored using simulation-based experiences designed for inter-and intraprofessional scenarios. The resulting four-domain I-BID© Handoff Tool (Guido-Sanz, 2022) may facilitate sharing critical medical information in military settings and may have potential forthcoming use in civilian mass casualties, disaster scenarios, and in a variety of clinical circumstances where handoff of medical information is required.

Declaration of Conflicting Interests

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