



ORIGINAL ARTICLE

The transition of patient care: Exploring the outcomes of prehospital to hospital patient handover practices and healthcare provider education

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ABSTRACT

Introduction: Inadequate patient handover is linked to numerous medical errors and lapses in communication between hospital healthcare providers and prehospital healthcare providers. Undergraduate healthcare curricula may limit programme-specific education on patient handover and shift learning to informal learning opportunities. This study aimed to investigate the outcomes of qualified healthcare provider (HCPs) educational programmes to determine the adequacy of handover practices, the source of their training, and their interprofessional acceptance of these practices.

Methods: A multi-method study design was used – a document analysis of HCP programme outcomes and a two-section questionnaire. The questionnaire was sent to HCPs to determine the impact of patient handover practices on current healthcare systems and their opinion on whether the training on handovers is sufficient.

Results: HCPs indicated little educational interaction regarding patient handover. Most participants felt handover education relied predominantly on informal training. With their existing knowledge, many HCPs revealed that they were comfortable in handing over a patient. Little interprofessional confidence regarding patient handover information indicates minimal interprofessional collaboration toward standardised approaches for patient handover.

Conclusion: This study indicates a lack of standardised handover procedures, which leads to HCP self-interpretations. There is low trust between HCPs regarding information received. The study highlights the need for standardised handover training in healthcare curricula to improve patient safety and interprofessional collaboration.

African relevance

- Patient handovers between healthcare providers are an integral part of every healthcare system, particularly so in Africa, where resource limitations dictate fragmented healthcare systems, with patient referral across healthcare levels a necessity for specialised care in many settings.
- Handovers typically occur between primary health care providers, prehospital (emergency medical care providers), emergency department staff, and inter-hospital staff and intra-departmental handovers within hospitals.
- Enhancing patient safety: Standardised handover practices with clear communication can significantly reduce medical errors and improve patient safety.

- Optimising resource allocations: By ensuring accurate information transfer, this study can contribute to optimising the use of limited resources in African healthcare settings.
- Building interprofessional collaboration: Standardised handover practises improve collaboration and knowledge sharing.

Introduction

The delicate period when patients are handed over between healthcare providers (HCPs) is pivotal for patient management across various care settings, from the prehospital environment to the emergency department (ED), ED to specialised care wards or back to general care. With the potential for handover information being lost, distorted,

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or misinterpreted, the handover period has been identified as a vulnerable period in the continuum of care. Thus, effective communication practices are crucial in eliminating these risks [1]. HCPs should be well-trained to ensure clear communication to convey essential clinical information [2] during the handover process.

A rushed patient handover process leads to miscommunication between HCPs, and, as such, crucial information is lost or misinterpreted [1]. Inadequate patient handovers have been linked to up to 24 % of missed diagnoses in emergency departments, with as many as 10 % linked to patient death, which could have been prevented by eliminating communication errors between HCPs [3]. The 2017 Joint Commission Annual Report on Quality and Safety highlighted poor handover practices as the leading cause of sentinel events, which include patient deaths, permanent harm, or severe temporary harm. [4]. The reasons identified for an unstandardised approach to patient handover are inadequate HCP education and Health Professions Education (HPE) in undergraduate and postgraduate medical programmes [5].

Traditionally, patient handover education takes place in lecture rooms. However, the focus has shifted to informal learning during clinical practice rotations in the healthcare system [6]. This informal learning has substantial variabilities in how the learner is educated and the methods used [6]. While informal learning can introduce learners to interprofessional education (IPE) and communication with various HCPs [7,8], they lack the structure and consistency to ensure competency.

Gordon [1] highlights the global initiative to reduce working hours amongst hospital medical staff, which has led to a significant increase in patient handover opportunities. Gordon found that many published works discussed improving handover, but more evidence was needed. The lack of evidence has left educators responding to various ways of educating learners according to best practices, but these teachings still lack the critical evaluation from various healthcare environments regarding validity [1].

Reyes et al. [9] conducted a survey to determine medical students' involvement in patient handover. Their results indicated that medical students participated in the patient handover process, although with little supervision. The survey also identified fourth-year medical students' need for formal education or training. Stojan et al. [10] verify that much emphasis is placed on educating students on patient handover but that this training is ineffective in allowing them to be prepared to perform in this area. They elaborate that medical students are expected to assume patient care responsibilities, including patient handover, without receiving the necessary guidance or educational methods.

The World Health Organization (WHO) stipulates that all healthcare training programmes should include patient handover as an outcome [10]. The lack of local literature on curricula dissemination of patient handover in HEIs indicates that local HEIs may not adhere to the WHO guidelines on patient handover.

The study aimed to investigate (i) training programme curricula in the local context, (ii) current handover practices of qualified HCPs, (iii) how HCPs were educated on the topic of patient handover, and (iv) the interprofessional acceptance of how patients are handed over.

Method

Study design

The study design consisted of a multi-method design. A document analysis of exit-level outcomes for emergency medical care, nursing, and MBChB programmes presented was conducted using the South African Qualifications Authority (SAQA) database, where SAQA is the oversight body of the National Qualifications Framework (NQF), which oversees the further development and implementation of NQF and sub-frameworks. A two-section questionnaire was used to investigate the handover practices and opinions of healthcare providers. The first section consisted of closed questions, and the second included open-ended

questions to gather qualitative data for thematic analyses [11].

Research setting

The study took place in Bloemfontein, Free State in South Africa. Purposive sampling for prehospital HCPs was used to investigate the handover practices. Three diverse healthcare facilities were used to investigate patient handover practices and experience from hospital healthcare providers (H-HCPs): 1. An academic specialist hospital with a level 1 ED offered access to specialised HCPs. 2. An academic primary healthcare hospital provided insights from primary care HCPs. 3. A community health centre allowed for the research topic amongst HCPs providing healthcare to underserved populations to be explored.

Participants

Two groups of HCPs were included in this study. 1. H-HCPs with university degrees working in emergency units, casualty units, maternity units, paediatric wards, intensive care units, and healthcare clinics, and 2. Prehospital healthcare providers (P-HCPs) employed by private services were also included due to the lack of practitioners with SAQA-aligned qualifications in the public sector at the time. The authors had intricate knowledge of all P-HCPs in both the public and private sectors. Thus, purposeful sampling was used for P-HCPs licensed with the Health Professions Council of South Africa (HPCSA) and who had obtained their qualifications through recognised universities.

Data collection

The SAQA database was used to analyse the exit-level outcomes for the emergency medical care, nursing, and MBChB health science programmes. The document analysis of the HCP questionnaire consisted of 38 quantitative questions and four open-ended questions for both H-HCPs and P-HCPs. Directors for public academic hospitals provided approval to ward managers for dissemination of the electronic questionnaire. The initial paper distribution was planned for September 2020 but was shifted to an online format on Google Forms in December 2020 due to the COVID-19 restrictions.

Hospital unit managers sent electronic invitations to unit staff, and P-HCPs were contacted by the author(s) to obtain informed consent for participation. We could not determine how many questionnaire invitations were sent to H-HCPs. Due to a low response rate, 77 printed questionnaires were distributed to healthcare unit managers, while 19 P-HCPs provided consent and contact particulars. Follow-up requests for completion of questionnaires were sent to all unit managers throughout the data collection phase but were not required for P-HCPs. Forty-four out of the 77 (57 % response rate) H-HCPs and 19 out of 19 (100 % response rate) P-HCPs completed the questionnaires.

Data analysis

Exit-level outcomes from each SAQA-identified programme were analysed for common recurring phrases related to patient handover and communication education (independent variable), and depth of knowledge synthesis was established through dependant variables. The data from the completed questionnaires were captured manually on Google Forms to combine and export the data to an Excel spreadsheet.

The authors analysed the quantitative data, which was presented in tabular form. Participant responses for each question were interpreted using descriptive statistics, specifically frequency distribution [12]. Thematic analysis of the open-ended responses was analysed inductively [14] and consisted of three phases: open, axial, and selective coding [1], with each phase informing the next.

Ethical approval and consent to participate

The study's ethical approval was obtained through the University of the Free State's Health Sciences Research Ethics Committee (UFS-HSD2020/0011/2807). The authorisation to conduct research in provincial healthcare facilities was obtained from the Free State Department of Health.

The H-HCPs and P-HCPs consent was voluntary, and anonymity was maintained by excluding any identifiable questions. No names or identifying information about the participants was used in the results and reports.

Results

Upon examining the SAQA [13] registered documentation of HCP programmes, it was found that only the prehospital healthcare provider (P-HCP) qualification, the Diploma in Emergency Medical Care (DEMC), and the Bachelor of Emergency Medical Care (BEMC) programmes stipulate patient handover as an exit level outcome. The BEMC programme was examined as it replaced the discontinued Bachelor of Technology: Emergency Medical Care (BTech: EMC) programme. No public information could be obtained.

A total of 63 questionnaires were returned (19 P-HCPs; 44 H-HCPs), which represented a 66 % response rate (63 from 96). A two-month data collection period was allowed, and after multiple follow-up requests for completion and due to the COVID-19 pandemic, the questionnaires were closed (Tables 1 and 2).

The average experience of H-HCPs was ten years, with P-HCPs averaging 13 years of operational experience.

Educational experience

Sixty-three per cent (40/63) of HCPs indicated that they received some formal educational training, but most of them clarified that their patient handover training relied mostly on informal, in-field training – 68 % of P-HCPs (13/19); and 73 % of H-HCPs (32/44). The formal assessment strategies used for both P-HCPs and H-HCPs during their higher education training are indicated in Table 3.

Post-educational training in a real-world healthcare environment highlighted that H-HCPs were mostly comfortable at 64 % (28/44) and P-HCPs at 53 % (10/19), with 37 % (7/19), indicating neutrality to handing over patients.

With interprofessional education being incorporated into healthcare programmes, 54 % (24/44) of H-HCPs showed an implementation of IPE, with 32 % (6/19) of P-HCPs indicating IPE involvement. To further their knowledge, 21 % (4/19) of P-HCPs and 11 % (5/44) of H-HCPs attended a patient handover workshop.

Prehospital inter-qualification handover

While 63 % (12/19) of the P-HCP participants reported using a standardised handover approach, 32 % (6/19) reported having never recognised a standard approach from lower-qualified P-HCPs. Another 32 % (6/19) indicated rarely observing a standard approach. Due to the environment of the P-HCPs, 95 % (18/19) identified handover time as unprotected from interruptions, while 26 % (5/19) felt comfortable with the information they received regarding a patient's condition. The same 26 % (5/19) of P-HCPs confirmed they received enough information to clearly continue patient management and conform to the continuum of care post-handover.

Prehospital to hospital patient handover

Despite 82 % (36/44) of H-HCP participants working frequently with prehospital personnel, 50 % (22/44) of these participants identified a standard handover approach used by P-HCPs, while 63 % (12/19) of the

P-HCP participants confirmed using a standard approach for patient handover. Moreover, 43 % (19/44) of H-HCPs entrusted with the continuum of care, expressed concerns about receiving sufficient information to ensure smooth care transitions. Despite 27 % (12/44) of H-HCPs using dedicated handover areas, which corroborates with the P-HCPs reporting at 11 % (2/19), 80 % (35/44) of H-HCPs reported that they received written patient reports post-handover.

Inter-/Intra-hospital patient handover

Transferring patients between wards, units, or hospitals is a regular occurrence [2]. The H-HCP participants noted that 50 % (22/44) of other H-HCPs used a standardised approach, tool, or acronym to transfer patient information and responsibility for the care continuum. Similarly, 48 % (21/44) revealed to have recognised a standardised approach, tool, or acronym when receiving patients from other HCPs.

Forty-five per cent (20/44) of H-HCPs understood the handover information they received from other H-HCPs, whereas 57 % (25/44) concluded that they received only enough information to maintain the care continuum adequately. For P-HCPs, 32 % (6/19) of the participants confirmed confidence with H-HCP information for the care continuum, and H-HCP participants report that 77 % (34/44) received documentation from the transferring facility, whereas P-HCPs rated it lower at 53 % (10/19) during intra-facility transfers.

Healthcare provider (HCP) perceptions on patient handover protocols/procedures

The P-HCP participants highlighted that 26 % (5/19) were content with how they conducted patient handovers, with the remaining 74 % (14/19) perceiving it as erroneous. The H-HCP participants indicated 41 % (18/44) satisfaction, which made them more accepting of current practices. The majority of all HCPs indicated that they asked multiple questions during the handover process to confirm the information that they received. They emphasised that the main reasons for questions during the handover process were due to limited time and minimal privacy.

Comparing the information received from the P-HCP participants regarding the patient's diagnoses after handover, 53 % (10/19) participants reported a mismatch of information, while 54 % (24/44) H-HCP participants revealed a similar information disconnect. Thirty-six per cent (16/44) of H-HCP participants found the information received from P-HCPs credible, with similar unreliability found in 21 % (4/19) of P-HCP participants receiving information from lower-qualified P-HCPs. With the continuum of care being the goal in healthcare, 42 % (8/19) P-HCPs and 64 % (28/44) H-HCPs believed the information they received, in effect, supported the healthcare continuum.

The mismatch of information explains the duplication of diagnostic tests, where 68 % (13/19) P-HCP and 52 % (23/44) H-HCP participants confirmed diagnostic duplication after patient handover, while 10/44 (23 %) were neutral.

Formal patient handover protocols: current stance

Face-to-face patient handover indicated dominance. Ninety-five per cent (18/19) of P-HCP participants and 86 % (38/44) of H-HCP participants indicated this manner of handover as the norm. Telephonic patient handover was second and conducted by 55 % (24/44) of H-HCP participants and 32 % (6/19) P-HCPs. Confirming patient management correctness and completeness of information transfer, 46 % (20/44) of H-HCP participants indicated the use of written patient records during patient handover. However, 68 % (13/19) of P-HCP participants indicated receiving these patient records after patient handover. Eighty per cent (35/44) of H-HCP participants confirmed receiving patient records from P-HCPs after patient handover.

Aligning to international standards using acronym-based patient

Table 1
Demographical characteristics of hospital healthcare providers (H-HCP).

Demographic characteristics of all H-HCPs (N = 44)	
Qualifications	
Doctors	41 %
Nurses	59 %
Units	
Emergency/casualty department	43 %
Paediatric ward	16 %
Maternity ward	16 %
Primary clinic	25 %
Experience	
0 – 4 years	11 %
5 – 9 years	32 %
10 – 14 years	18 %
>15 years	21 %
Not indicated	18 %

Table 2
Demographical characteristics of prehospital healthcare providers (P-HCP) working in the private prehospital system at various qualifications.

Demographic characteristics of all P-HCPs (N = 19)	
Qualifications	
ECP	74 %
National Diploma	21 %
DEMC	5 %
Experience	
0 – 4 years	11 %
5 – 9 years	21 %
10 – 14 years	32 %
>15 years	36 %

ECP – Emergency Care Practitioner; DEMC – Diploma Emergency Medical Care.

handovers, it appears that the P-HCP participants had more contact with recognised acronyms. Table 4 indicates which variations of the known handover acronyms the P-HCP and H-HCP participants encountered. The HCPs could indicate multiple options to interrogate how many acronyms they had encountered.

Open-ended question responses and themes

In the open phase of coding, 173 items were recorded. During the axial coding of the process, the 173 items were synthesised into nine general themes. As the analysis progressed to the final selective level, the following key themes were identified:

1. *Structured handover protocols are patient-centred:* Participants uniformly indicated that structured patient handover procedures all align to benefit the patient and care continuum.
2. *Who should be teaching patient handover:* The majority of HCPs indicated that patient handover should be included in the final years of

Table 3
Assessment methods completed by participants around patient handover.

P-HCP assessment tools (N = 19)		H-HCP assessment tools (N = 44)	
Written assessment	74 %	Written assessment	50 %
Simulation based	42 %	Simulation based	48 %
Role-play	48 %	Role-play	34 %

P-HCP – prehospital healthcare provider; H-HCP – hospital healthcare provider.

Table 4
Patient handover acronyms identified by HCPs.

	P-HCP (N = 19)	H-HCP (N = 44)
ISBAR	32 %	7 %
iSoBAR	21 %	9 %
ATMIST	16 %	2 %
IMIST-AMBO	11 %	0 %
MIST	74 %	14 %
ASHICE	16 %	0 %
I-PASS	5 %	0 %
None recognised	N/A	71 %

ISBAR: Introduction, Situation, Background, Assessment, and Recommendations [15].

iSoBAR: Identify, Situation, Observation, Background, Assessment/Action, and Readback/Responsibility [16].

ATMIST: Age, Time, Mechanism, Injury/Illness, Signs and symptoms, and Treatment [17].

IMIST-AMBO: Identification, Mechanism of injury, Injuries identified, Signs and symptoms, Treatment and trends, Allergies, Medications, Background history, and Other information [18].

MIST: Mechanism of injury, Injuries or Illness, Signs and treatment, and time [19].

ASHICE: Age, Sex, History, Injuries, Condition, and Expected time of arrival [20].

I-PASS: Illness severity, Patient summary; Action list, Situational awareness/contingency planning, and Synthesis by the receiver [21].

health science programmes but that the topic also be formally assessed as part of a practical module within a programme.

3. *Collaboration is required:* Most HCPs connected "time" and the continuum of care as the focus for collaboration to improve patient outcomes. Participants elaborated in stating that real-world encounters should inform curricular development related to patient handover from all HCP specialities, thus removing the "silos" of healthcare programmes.
4. *How should learners be educated:* Patient simulation for practising and formal assessment of patient handover showed dominance. Objective structured clinical examination (OSCE) alongside role-play also highlighted preferences between participants. Appropriate post-assessment feedback was highlighted as an important conclusion for teaching and learning.

Discussion

All HCPs agreed that the topic of patient handover, as important as it is, is neglected within educational and practical environments. It is, however, clear that HCPs have adapted to this missing link in the continuum of care by reassuring their overall content in current patient handover practices.

There appear to be varying degrees of familiarity with internationally used handover acronyms, and although P-HCPs indicated some interaction with these acronyms, the H-HCPs confirm minimal familiarity.

The blame for the unfamiliarity of international handover acronyms cannot solely be placed on the healthcare providers. Exit level outcomes identified through the SAQA programme documents elucidate that interprofessional education, communication, or patient handover for enhancing the continuum of care is not included as a critical exit level assessment outcome. The topic of patient handover within various health science curricula requires formal collaboration between academic institutions and hospitals to confirm relevance and impact. Margalit et al. stated that integrated and interdependent healthcare teams should function and communicate successfully for the common goal of improved healthcare [7].

Without formal consultative processes in place, health science

programmes have inadvertently shifted the topic of patient handover to HCPs through informal in-field teaching and learning. Formal assessment on patient handover is still occurring in health science programmes (Table 3), which highlights a skewed link between uniformity of curricular outcomes and assessment of what has been taught. A study conducted in 2015 concluded that a one-day workshop on the SBAR acronym before starting work-integrated learning improved all students' confidence [10], however, HCPs confirmed that attended workshops rarely included patient handover as a topic. Although it appears that formal education on patient handover is somewhat eluded, HCPs are, in fact, content with how they complete patient handover in real-world environments.

Literature does, however, paint a different picture. Bost et al. [22] identified that patient handovers to various HCPs can occur up to three times. It was also observed that H-HCPs were multitasking throughout the handover, which required multiple follow-up questions to understand why the patient was brought to the hospital. A qualitative study conducted in 2010 [18] highlighted that H-HCPs became dismissive toward P-HCPs solely because the P-HCPs "rambled on" with information not deemed necessary by the H-HCPs. The study concluded that a high frequency of interruptions could be linked to the mismatch of what P-HCPs believed was essential and what the H-HCPs required to continue care. HCPs reported that patient handover time is unprotected from interruptions, which could be due to a lack of protected space where a handover can occur, leaving the process fragmented.

Dismissive behaviour could be extended to inter-qualification handovers as well. P-HCP participants admitted that they rarely feel comfortable with the information they receive from lower-qualified P-HCPs, again linking this to unprotected handover spaces, which are hard to come by in the prehospital environment. An area where both pre-hospital and hospital HCPs interact often is during intra-hospital transfers. Both P- and H-HCPs revealed a low level of confidence in information received from one another. Both groups indicated that the transferred information was unclear or just enough to continue managing the patient, which led to duplication of diagnostic tests and multiple questions being asked from both groups for clarity. The majority of participants confirmed that written patient report forms (PRFs) were handed to them after the verbal handover was completed. It is worth noting that instances were highlighted where no written report followed, showing a complete detachment of patient information during patient handover in these situations.

The current stance on patient handover between the two healthcare participant groups points out that face-to-face handover appears to be the norm. With face-to-face inter-professional communication being the norm, each facility or unit should adapt to using a particular handover protocol in an effort to decrease medical errors and preventable adverse events [6], but not without academic consultation first. If teaching and learning align with industry norms, it will enhance the confidence of learners in adjusting to handover protocols. One participant in the open-ended questions explained that learners require knowledge to fall back on during stressful situations, which is the responsibility of health science programmes.

Patient handover, however, requires becoming a planned teaching and learning activity within various health science curricula, which in turn needs careful planning on educational and assessment techniques to be utilised. Most HCPs indicated that assessing patient handover was essential to instil deep learning. Participants further suggested that simulation-based medical education (SBME), alongside OSCE assessments, would serve the purpose of introduction, repetitive practice, and formal assessment of patient handover. Seaton et al. found that incorporating patient handover into SBME creates the opportunity for authentic learning practices where simulated environments and patients can be reproduced multiple times with memorable and measurable effects on learning [23]. It is, however, crucial that appropriate feedback be presented to learners and the healthcare industry for changing health science-related topics according to industry requirements, as without

feedback, assessment becomes counterproductive [24].

Once patient handover is embedded within health science curricula, the topic could possibly be extended to include IPE. The greater part of the participants agreed that IPE should be included in health science curricula, with one participant supporting the integration of IPE but elaborating that IPE could reinforce collaboration on the topic. The participant explained that information being handed over is a versatile and dynamic topic and will differ from HCP and healthcare environment according to the clinical pathway or objective of the patient.

The implementation of the TeamSTEPPS curriculum has shown promise in elevating the inclusion of softer skills, such as interprofessional communication, which, in turn, indicated improvement in the continuum of care [25].

Potential solutions on handover acronyms

The authors suggests various handover acronyms: IMIST-AMBO for stable patients (casualty/emergency), ATMIST for urgent/busy emergencies, MIST for critical patients/crowded trauma, and ASHICE for inter-facility transfers with ongoing updates. For doctor-nurse handovers, ISBAR and iSoBAR are considered, and for bedside nursing handovers, I-PASS is preferred. Further research on these acronyms is recommended.

Limitations

A primary limitation of this research study was the sample size. While the authors attempted to gather as much information from various HCPs as possible, the COVID-19 pandemic and restrictions on movement limited the ability to do so. This limitation in sample size might not be enough to generalise findings to all HCPs, but despite these limitations, the authors believe that the study provides valuable insights and a foundation for future research.

Many P-HCPs were not part of the research due to their qualifications not aligning with a recognised SAQA programme, but their insight could potentially have made an impact on the findings. Even though the data corresponds to the lack of stipulated exit-level outcomes described in SAQA documents, obtaining programme-specific curricula could indicate a more in-depth interaction with patient handover education. It is suggested that future research have a larger sample size, which includes the non-SAQA-aligned P-HCPs, for a more reliable representation of the topic on patient handover. Further research is also suggested to include programme and university-specific programme outcomes to inform the context of patient handover education.

Conclusion

Patient handover is a contentious topic with major effects on all HCPs, facilities, and the continuum of care. A unified healthcare workforce, including educational institutions, is required to remove the healthcare silos mentioned by participants, taking us one step closer to the reality of interprofessional education and collaboration. The bulk of the literature clearly indicates that formal, structured patient handover protocols and acronyms are beneficial to HCPs, facilities, and, most importantly, patient care. HCPs have, however, adapted to the lack of formal training programmes and activities attempting to align the continuum of care of patients with what they interpret as correct and valid information to hand over. Formal educational programmes, presented as short learning programmes and undergraduate curricular adoption, could enlighten both the current HCP workforce and learners together for improved acceptance of international acronym-based patient handover.

Dissemination of results

The results were reported to the educational institutions, and

improved handover training was contemplated.

Authors' contribution

Authors contributed as follows to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or critically revising it for important intellectual content: GM: 70 %; HB: 30 %. All authors approved the publication of the version and agreed to be accountable for all aspects of the article.

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Declaration of competing interest

The authors declared no conflicts of interest.

While preparing this article, the authors used the following tools for language and readability assistance: Grammarly and Google Bard. Thereafter, the authors reviewed and edited the content as needed and take full responsibility for the publication of the content.

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