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Major Article

Self-reported behaviors and perceptions of Australian paramedics in relation to hand hygiene and gloving practices in paramedic-led health care

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Background: Noncompliance with recommended hand hygiene and gloving practices by workers in the emergency medical services may contribute to the transmission of health care–associated infections and lead to poor patient outcomes. The aim of this study was to explore the self-reported behaviors and perceptions of Australian paramedics in relation to their hand hygiene and gloving practices in paramedic-led health care.

Methods: A national online survey (n = 417; 17% response rate) and 2 semistructured focus groups (6 per group) were conducted with members of Paramedics Australasia.

Results: Although most of the study participants perceived hand hygiene and gloving to be important, the findings suggest poor compliance with both practices, particularly during emergency cases. All participants reported wearing gloves throughout a clinical case, changing them either at the completion of patient care or when visibly soiled or broken. Hand hygiene was missed at defined moments during patient care, possibly from the misuse of gloves.

Conclusions: Paramedic hand hygiene and gloving practices require substantial improvement to lower potential transmission of pathogens and improve patient safety and clinical care. Further research is recommended to explore how to alleviate the barriers to performing in-field hand hygiene and the misuse of gloves during paramedic-led health care.

BACKGROUND

Hand hygiene through the use of alcohol-based handrubs (ABHR) or washing with soap and water is considered the most effective infection prevention and control (IPC) practice for minimizing the transmission of health care–associated infections (HAIs) in paramedic-led health care.[1,2] However, 3 studies in North America have identified noncompliance with hand hygiene practices among emergency medical services (EMS) workers before touching patients, during patient contact, and between patient cases.[3-5] The noncompliance was attributed to poor access to hand hygiene products[3] and fatigue, forgetfulness, operational pressure, and lack of training.[4,5] In one study, a high bacterial load was found on the hands of the EMS workers after patient care, thereby increasing the risk of transmitting HAIs.[3]

Gloving is another essential IPC practice for EMS workers because of the increased risk of exposure to blood and other body fluids during patient care.[6-9] Experience in acute health care services has shown that the failure to change contaminated gloves at appropriate times during patient care results in poor hand hygiene compliance.[10,11] North American research has found that EMS workers were not changing gloves at appropriate moments during clinical cases.[4,5] The extent to which this occurs among Australian paramedics remains unclear.

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The Australian health care workforce is provided with detailed advice in the form of national guidelines and standards on recommended IPC practices that are aimed at minimizing the transmission of HAIs.[1,12] This advice includes the National Hand Hygiene Initiative implemented by Hand Hygiene Australia (HHA) that provides extensive guidance on appropriate hand hygiene practices.[13] The state and territory ambulance authorities in Australia disseminate advice on IPC practices to their paramedics in the form of operating procedures. Despite this policy rich environment for IPC, there is some evidence that Australian paramedics may be breaching recommended IPC practices when caring for their patients.[14-17] What is not understood is whether these breaches involve fundamental IPC practices such as hand hygiene and gloving. Therefore, the aim of this study was to explore the self-reported behaviors and perceptions of Australian paramedics in relation to their hand hygiene and gloving practices in paramedic-led health care.

METHODS

Research design

A sequential mixed-methods research design[18] was selected to guide data collection and analysis for the study. Study participants were recruited from Paramedics Australasia (PA), the peak professional organization representing Australian paramedics.[19] Members of PA are employed mostly by Australian state or territory ambulance services, with membership being voluntary.

This study had 2 parts. First, an online self-administered questionnaire was developed to survey PA members in 2013 about their self-reported behaviors and perceptions related to IPC practices in paramedic-led health care. The survey of paramedics on infection control (SoPIC) consisted of 29 constructs and 211 items that targeted the 4 broad IPC areas of hand hygiene and gloving practices, environmental hygiene, aseptic nontouch technique, and clinical governance. Second, 2 semistructured focus groups were conducted with PA members in 2015 to triangulate the participant responses from the SoPIC. This article reports on the findings from the SoPIC and focus groups for hand hygiene and gloving practices.

SoPIC development, piloting, and administration

Development of the questionnaire for the SoPIC was informed by an extensive literature review, content analysis of national IPC guidelines and standards, and IPC operating procedures provided by 4 major Australian ambulance services. In addition, semistructured interviews were conducted with 14 IPC experts drawn from senior ambulance managers (n = 5), public health specialists (n = 3), infection control practitioners (n = 4), and university academics (n = 2). The paradigms of predisposing, reinforcing, and enabling factors from social learning theory and the PROCEDE-PRECEED (Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development) planning model were used to guide the grouping of themes, constructs, and variables in the SoPIC.[20-22] The questionnaire contained both open-ended and closed questions that elicited both textual and nontext data. Table 1 shows the themes, constructs, variables, and question details used in the questionnaire for participant attributes and hand hygiene and gloving practices.

The SoPIC was piloted with a small convenience sample from across Australia that included a senior ambulance manager, practicing paramedics (n = 10), paramedic educators (n = 3), university paramedic academics (n = 5), and IPC experts (n = 2). This enabled the improvement of construct validity and refinement of the question stems and response choices, and ensured the questionnaire could be completed within 20 minutes. Construct validity was assessed through discussions with pilot participants, written feedback received, and responses to items. Post pilot changes to the questionnaire functionality were tested online before going live.

The SoPIC was conducted over a 4-week period in September 2013 with PA members being informed about the survey via e-mails through the PA national office.

Semistructured focus group

Two semistructured focus groups (FG1 and FG2) were held prior to PA professional development events in 2015. Participants were self-selected from an e-mail sent from PA administrators to their members. To be eligible for inclusion, participants must have been practicing paramedic members of PA. Participation was voluntary, and data were deidentified. Secondary inclusion criteria were not used because the number of eligible applicants did not exceed the number required for each focus group.

Discussion topics aligned with the 4 broad IPC areas covered in the SoPIC: hand hygiene and gloving practices, environmental hygiene, aseptic nontouch technique, and clinical governance. Three themes were explored for each area: difficulties of maintaining IPC practices in paramedic-led health care, adequacy of IPC practices of Australian paramedics, and what may be required to improve IPC practices in paramedic-led health care. This strategy enabled the interviewer to adapt, modify, and add to the planned themes in response to the focus group discussion.[23]

Three short video vignettes of 1-2 minutes that depicted usual paramedic operational events were used to stimulate discussion for each theme.[23] The video vignettes were selected and edited from the Special Broadcasting Service "HELP" documentary (episodes 1 and 6) available for public access on the Special Broadcasting Service Australia YouTube channel.[24]

Data analysis

The textual data were analyzed through an interactive process of describing, classifying, and connecting information. This process used a combination of initially collating data around a small number of a priori codes followed by thematic analyses,[25-28] where inductive codes were used to capture emergent themes.[26,28]

The nontext data (categorical, ordinal, and Likert scales) were summarized using descriptive statistics for variables. Inferential statistics were then used to test for associations between variables using Pearson χ^2 tests and the McNemar test. In addition, logistic regression models were fitted to evaluate the relative importance of multiple predictor variables on dichotomized response variables, allowing adjusted *P* values to be computed. Confirmatory factor analysis was not undertaken on the survey data because the primary focus was on gaining an understanding of a wide range of specific behaviors and perceptions of Australian paramedics rather than identifying underlying constructs.

Ethical clearance

Ethical clearance was obtained from the University of the Sunshine Coast Human Research and Ethics Committee (S/10/252 and S/14/719).

RESULTS

Demographic attributes of study participants

In 2013 there were 12,500 full-time equivalent paramedics in Australia,[29] and the PA had 2,449 financial (active) paramedic members.[19] There were 802 active members of PA[19] who entered