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Preventing and controlling human noroviruses in South Carolina long-term care facilities: An analysis of institutional policies and procedures

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Background: Long-term care (LTC) facilities are the number one setting for human norovirus (HuNoV) outbreaks in the United States (60%).

Methods: We aimed to determine alignment of policies and procedures in LTC facilities in South Carolina with Centers for Disease Control and Prevention (CDC) recommendations and to determine readability based on Federal Plain Language Guidelines and Microsoft Word readability statistics.

Results: Most facilities (n = 21) had procedures for hand hygiene, but recommendations for hand-washing events and duration varied greatly. Less than half (n = 11) had separate procedures devoted to HuNoV outbreak control. Fifteen required disinfection of bodily fluids. Seven had procedures for exclusion of sick staff during an outbreak. Both hand hygiene and bodily fluid cleanup procedures had low mean scores for readability. Mean Flesch Reading Ease and Flesch-Kincaid Grade Level for both procedures were in the range of difficult to understand.

Conclusion: Most LTC policies and procedures were not consistent with CDC recommendations for HuNoV. Moreover, readability of all procedures is needed so LTC workers can easily understand and implement prevention and control procedures.

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Long-term care (LTC) facilities are an ideal environment for acute gastroenteritis (AGE). The close living arrangements and frequent contact between residents, staff, and visitors facilitate the spread of pathogens associated with AGE. Older adults, who represent a large proportion of LTC facility residents, are highly susceptible to AGE because of their greater likelihood of comorbidities and declining immunity.¹

According to the Centers for Disease Control and Prevention (CDC), LTC facilities are the most common setting for outbreaks associated with human noroviruses (HuNoVs) (60%), a leading cause of AGE in the United States.² To prevent HuNoV outbreaks in LTC facilities, evidence-based prevention and control strategies are

needed with institutional policies and procedures as a source for communicating such strategies. Policies and procedures, common in health care settings, can inform and influence decisions, therefore improving consistency of actions established by laws and regulations, standards of best practice, and institutional executive decisions. For these policies and procedures to be effective, they should be based on best practices and be easy to read and understand.³

We hypothesize inclusion of guidelines to prevent and control HuNoV in most LTC facility policies and procedures is limited. The purpose of our study was (1) to determine alignment of policies and procedures from a sample of LTC facilities in South Carolina (SC) with CDC recommendations for prevention and control of HuNoV and (2) to determine readability of policies and procedures determined by agreement with the Federal Plain Language Guidelines and Microsoft Word readability statistics.

METHODS

All materials and methods used in this study were approved by the Clemson University Institutional Review Board. Informed consent was obtained before data collection began.

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Conflicts of interest: None to report.

Selection of institutional procedures

Institutional policies and procedures (hereafter referred to as procedures) related to the prevention and control of HuNoV were requested from 26 LTC facilities in SC during site visits conducted as part of a larger study. Requested topical procedures included the following: (1) hand hygiene, (2) HuNoV outbreak management, (3) environmental sanitation, (4) cleanup of bodily fluids, (5) dress code, and (6) laundry. Facilities that did not provide procedures during the site visit were contacted up to 3 times by phone. Nearly all (n = 24) provided procedures. One facility did not provide copies because the corporate office would not allow them to do so; the other never sent copies for unknown reasons.

Coding manual

A 2-part coding manual was created to analyze procedures (Table 1). Part 1 determined alignment of procedure content with 2 CDC guidance documents^{4,5} based on 6 distinct topics (85 items). The first 4 topics (ie, hand hygiene, outbreak management, environmental sanitation, bodily fluid cleanup) are documented strategies to prevent and control HuNoV infections.⁴ Procedures on dress code and laundry were also included because worker hygiene and handling of contaminated laundry can prevent the spread of HuNoV. The items in part 2 (26 items) were used to calculate readability scores for stand-alone (independent document addressing procedures for only 1 topic) hand hygiene and bodily fluid cleanup procedures based on the Federal Plain Language Guidelines.⁶ Hand hygiene procedures were selected because the CDC recommends hand hygiene as “the single most important method to prevent” HuNoV.⁴ Additionally, persons infected with HuNoV can produce large volumes of diarrhea and vomit, which are highly concentrated with the virus.⁷ Therefore, we think bodily fluid cleanup procedures are crucial in preventing HuNoV transmission in LTC facilities, which led us to also evaluate the readability of these procedures.

A coding sheet corresponding to the coding manual was created on SurveyMonkey (SurveyMonkey, Palo Alto, CA). The coding manual and sheet were piloted by 2 trained coders using procedures from 2 LTC facilities. After piloting, the coding manual and sheet were modified. The same 2 coders independently coded procedures for all facilities (N = 24). A third coder reconciled differences.

Data analysis

All categorical responses were converted to numerical values for statistical analysis. For each item in part 1, the number of facilities in compliance was determined. The readability scores were calculated using 2 methods: Federal Plain Language Guidelines and Microsoft Word readability statistics. First, a total score was calculated based on part 2 of the coding manual, which assessed alignment with the Federal Plain Language Guidelines. Descriptive statistics (mean, SD, and range) were then calculated using Microsoft Excel (Microsoft, Redmond, WA) for 6 of the 7 Federal Plain Language topics. One topic (paragraph organization) was analyzed separately for procedures written in paragraph form. Second, Microsoft Word 2010 (Microsoft, Redmond, WA) was used to generate 2 readability statistics: Flesch Reading Ease and Flesch-Kincaid Reading Level. Descriptive statistics (mean, SD, and range) were calculated for both.

Table 1

Summary of coding manual used for analysis of procedures in long-term care facilities in South Carolina

Manual section	Topics
Part 1: content of procedures (85 items)	<ol style="list-style-type: none"> 1. Hand hygiene (11 items) 2. Outbreak management (20 items) 3. Environmental sanitation (14 items) 4. Bodily fluid cleanup (13 items) 5. Dress code (11 items) 6. Laundry (12 items)
Part 2: Federal Plain Language Readability (26 items)	<ol style="list-style-type: none"> 1. Organization of the document (3 items) 2. Verb usage (5 items) 3. Noun and pronoun usage (2 items) 4. Other word issues (5 items) 5. Sentence organization (2 items) 6. Paragraph organization (4 items) 7. Aids to clarity (5 items)

RESULTS

The number of facilities that provided procedures and the number of procedures provided for each topic are reported in Table 2. Some procedures (eg, infection control) addressed multiple strategies in the same document; therefore, they might have been counted multiple times. The number of procedures provided by a LTC facility ranged from 1-15. Although some facilities did not provide procedures for certain topics, it does not necessarily mean that they did not have a procedure for that topic. Sometimes a facility simply could not find a procedure for a specific topic.

Hand hygiene

Most facilities (n = 21) required hands be washed with soap and water, but detail varied greatly. For example, many (n = 14) described when and how to wash hands and use hand sanitizers, with 3 including diagrams showing individual handwashing steps. Others (n = 7) either mentioned handwashing steps or when to wash hands but not both. Length of handwashing also varied, with 15 facilities requiring hands be washed for ≥ 20 seconds, 8 requiring hands be washed for ≥ 15 seconds, and 7 requiring hands be washed for 10-15 seconds. Furthermore, the length of handwashing sometimes (n = 6) varied across different procedure topics from the same facility (eg, hand hygiene procedures vs environmental sanitation procedures). In a few (n = 3), handwashing length even varied within the same procedure. For example, step-by-step written procedures mentioned one length, whereas a diagram showing handwashing steps suggested a different length. Nearly all (n = 22) listed contamination events that should prompt handwashing. All of those 22 facilities required hands be washed when soiled with bodily fluids and after removing gloves. Not many (n = 5) required handwashing after changing bed pans or resident briefs; before and after feeding residents (n = 6); after contact with inanimate surfaces of resident surroundings (n = 8); and when moving from one resident to another (n = 1). Hand sanitizers, as an alternative to handwashing when hands were not visibly soiled, were cited in most (n = 19) facility procedures.

Outbreak management

Approximately half (n = 13) had procedures for infection control during outbreaks of HuNoV or AGE. Two of the 13 provided *Clostridium difficile* outbreak management procedures, which LTC facility directors stated during on-site interviews were also used during an HuNoV outbreak. Two others used fact sheets on HuNoV

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