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Descriptive Analysis of Long-Term Care Facility Healthcare Worker Surveys in GA, NY, and
TN

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An abstract of
A thesis submitted to the Faculty of the
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in Epidemiology
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Abstract

Descriptive Analysis of Long-Term Care Facility Healthcare Worker Surveys in GA, NY, and TN

By Joseph Kellogg

It has been established that long term care facilities (LTCF) are a key component of both the incidence and prevalence of multi-drug resistant organisms (MDROs) within healthcare systems. Despite this fact, there is an inadequate body of work involving the role that LTCF nurse staffings and their unique considerations play in the transmission of MDROs. Novel methods and strategies are needed to better collect and interpret data involving transmission of MDROs in LTCFs.

This study seeks to contribute to this gap in knowledge by analyzing the information collected as part of an ongoing CDC funded research study of nursing contact networks within LTCFs. The study included collection of hourly survey data from staff in 9 facilities in GA, TN, and NY. In total, 18 different wards were sampled at these sites. Variations in frequency of care activities were evaluated; activities were categorized into enhanced barrier precaution (EBP) activities and non-EBP activities and stratified by time of day, HCW type and ward type.

Patient transfer (28%) was the most common EBP activity, while medication administration (37%) was the most common non-EBP activity. CNAs contributed the most to EBP activities (93%). Within any grouping of geographic location, there is considerable variation with large interquartile ranges of frequency of activities per hour. Differences in the median activities per hour exist when stratifying by ward type, but not by time in the shift. For specifically EBP activities, hourly frequency does not vary by ward type, while it does for non-EBP activity. Nursing activities can be recorded through scheduled mini-survey techniques, allowing quantification of activity types for epidemiologic analysis and research. Differences in care activities can be quantified using this technique.

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Background

The 2015 United States National Action plan for combating antibiotic resistance determined that LTCFs were to play a major role in the goal of reducing transmission of MDROs regionally [1, 6]. Though there has been a comparatively adequate amount of research in the more traditional acute care hospital setting [2]. LTCFs are still lacking a similar level of consideration. It is imperative that more information is gathered to better understand this subset of the health care system. LTCF patients are generally more susceptible to MDROs than the general population [4]. The patients receiving care at these facilities present with unique challenges that are dissimilar to the population found in acute-care hospital setting. Nursing home residents are not confined to rooms, but also very often require substantial assistance by staff with activities of daily living resulting in prolonged close contact with staff allowing abundant opportunities to transfer MDRO between workers and residents.

Numerous comorbidities that are more common in the LTCF population are a major contributing factor to the disparity in MDRO prevalence. These patients often live with medical devices that are necessary to their continued health, but that also put them at a greater risk for infection. These devices include urinary catheters, central lines, and mechanical ventilators. LTCF patients also experience treatments that are associated with an increased risk of MDRO colonization, such as wound care and frequent antibiotic prescription. LTCFs are forced to navigate an environment that can often be resource limited. Outside providers are responsible for providing services that most acute-care hospitals are able to perform themselves. Few LTCFs have reliable and convenient access to key components of infection prevention, notably antibiotic stewardship programs and laboratory testing.

The resource shortage in LTCFs goes beyond these more tangible resources [3]. Staffing can be a challenge in homes, as on-site specialists are scarce, and many homes have a high reliance on temporary staff. Physical space can often be an issue as well, where many LTCFs cannot afford to properly isolate patients due to space constraints. Combined these issues cause the protocols utilized by acute-care hospitals to not be reflective of the concerns found in LTCFs. This has resulted in a reduced capacity to combat MDROs due to the absence of similarly well researched protocols and procedures that are specific to LTCFs.

The protocols that are standard in the acute-care setting are repeatedly not appropriate in LTCFs [3]. Various care activities are more common in LTCFs than in acute-care hospitals, and the degree to which patients interact with one another is greater in LTCFs. These discrepancies, including others, result in acute-care guidelines that are vague and may not properly apply outside of their intended setting. The appropriate use of standard precautions in LTCFs is unclear to many HCWs. Roughmann et al. defined activities as enhanced barrier precaution (EBP) activities [5]. These activities had a higher risk of MDRO transmission than other standard precaution activities. Patient dressing, transferring, providing hygiene, changing linens, vent care, and wound care are all considered to be EBP activities. Further studies are needed to elucidate the relationship between these activities and MDRO transmission.

Further studies should be focused on HCW activity. A better understanding of HCW activities in LTCFs can help to explain current patterns of transmission, as well as guide infection control policy. Resource constraints in LTCFs mean that novel technologies may not be viable or as effective in the LTCF environment. Infection control policies that target specific HCW activities may also be the most reasonable method for LTCFs to reduce MDRO transmission.

Methods

The data for this analysis comes from the Epicenter Contact Networks in Long Term Care Facilities Study. The Epicenters study is a collaboration between several universities and state health departments. The surveys analyzed for this study were collected from a total of 9 nursing homes in GA, NY, and TN. In each state, 3 facilities were sampled, and in each facility, 2 different wards were sampled among long term care, rehabilitation (rehab), skilled nursing care, and ventilation wards were sampled. (Figure 2) Each ward was sampled twice, with approximately 1 month of time between each visit.

All regular HCW staff on each ward were included in sampling. Surveyors were MPH candidates from Rollins School of Public Health at Emory University. After consenting to the study, staff was surveyed once an hour beginning at 07:00 AM and ending at 02:50 PM, with breaks for the surveyors at the last 10 minutes of every hour and from 01:00 PM to 2:00 PM.

Each survey consisted of a “micro-interview” lasting approximately 30 seconds. The HCW was asked to recount the rooms they had entered in the past hour, and the activities that they performed in each room. HCW activities were placed into categories of activities based on findings of the Roghmann et al, study [5]. All survey responses were entered into REDCap. Data from REDCap was exported into Microsoft Excel and R Studio, where all data manipulation and analyses were performed. This analysis was performed on a subset of HCW staff that included only CNAs and nurses. Each sampling day was categorized into 4 time periods: from 07:00 – 08:50 AM, 09:00 – 10:50 AM, 11:00 – 12:50, and 02:00 PM and later. Analyses stratified by time (Figures 3 A & B) included only the earlier 3 time periods.

Results

This analysis included 1,455 total surveys comprised of 890 CNA surveys and 565 nurse surveys. (Table 1) Over half (54%) of the 7,575 activities recorded in the surveys were an EBP activity. Transfers (28%), hygiene activities (23%), and resident dressing (19%) made up the largest portions of EBP activities. (Figure 1A) Medication administration (37%) and nutrition activities (31%) made up the largest portions of non-EBP activities. (Figure 1B) Of the 18 separate wards sampled, 7 were long term care wards, 4 were skilled nursing wards, 3 were rehab wards and 4 were vent wards. (Figure 2)

CNAs were the most frequently surveyed HCW and were also those responsible for the greater median EBP activities per hour. (Figure 3A) This was consistent across all 3 earlier time periods. EBP activities generally did not change over the course of the morning. Non-EBP activities were more performed more frequently by nurses than by CNAs. Non-EBP activities among nurses were most often from the 09:00 AM to 10:50 AM time period. (Figure 3B) Median EBP activities were not significantly different across ward types. (Figure 4A, p-value 0.08) Median Non-EBP activities were significantly different across facility types. (Figure 4B, p-value <0.01)

Discussion

Until more research is performed in LTCFs, it will be difficult to address the unique challenges that they present in the goal of MDRO reduction. Patients of LTCFs are inherently at a greater risk of MDRO infection than those in the acute-care setting and it is time that these patients and facilities are studied appropriately. The Epicenters study aimed to characterize

HCW contact networks. Using a subset of that data, this study described patterns within the interactions of HCW and the activities they perform. Several key themes identified by this analysis can help guide protocol and policy formation in LTCFs.

First, CNAs should be targeted for education and guideline creation. Though this study did not directly associate CNAs with a greater risk of MDRO spread, it illustrated that CNAs are the workhorses of LTCFs when it comes to patient interaction. Furthermore, CNAs are responsible for more EBP activities than nurses. CNAs are more frequently engaging in these high-risk activities, and as such, should be the primary target of new regulations and education. Helping this subgroup of HCW interact with their patients more safely could go a long way in the reduction of MDROs.

Second, even with a wealth of resources, one mindset could be most helpful: constant vigilance. There is some variation over time in the frequency of EBP activities, but these activities are occurring all hours of the day. LTCF staff must be aware of this and put measures in place that focus on routine and consistency to ensure that mistakes are minimized or altogether eliminated. Some of the EBP activities may seem innocuous. A HCW may not be thinking about the risk of transmitting an MDRO between residents while helping a resident sit up in bed after having brushed another resident's hair. However, these have both been classified as EBP activities and ideally, should both be taken seriously. The focus on HCW education and policy/procedure formation should not be on perfection, but on the minimization of risk.

Tables & Figures

Figure 1A.

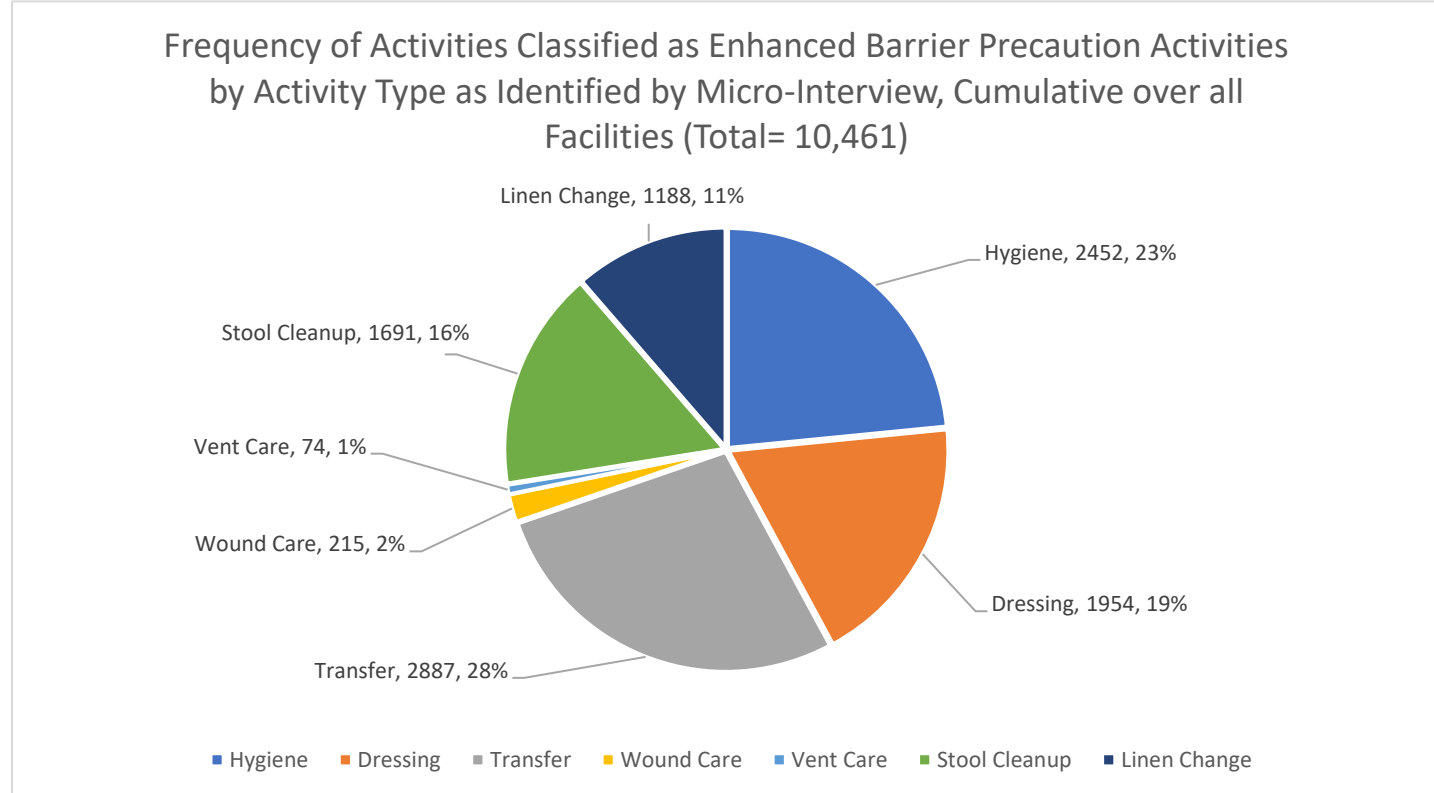


Figure 1B

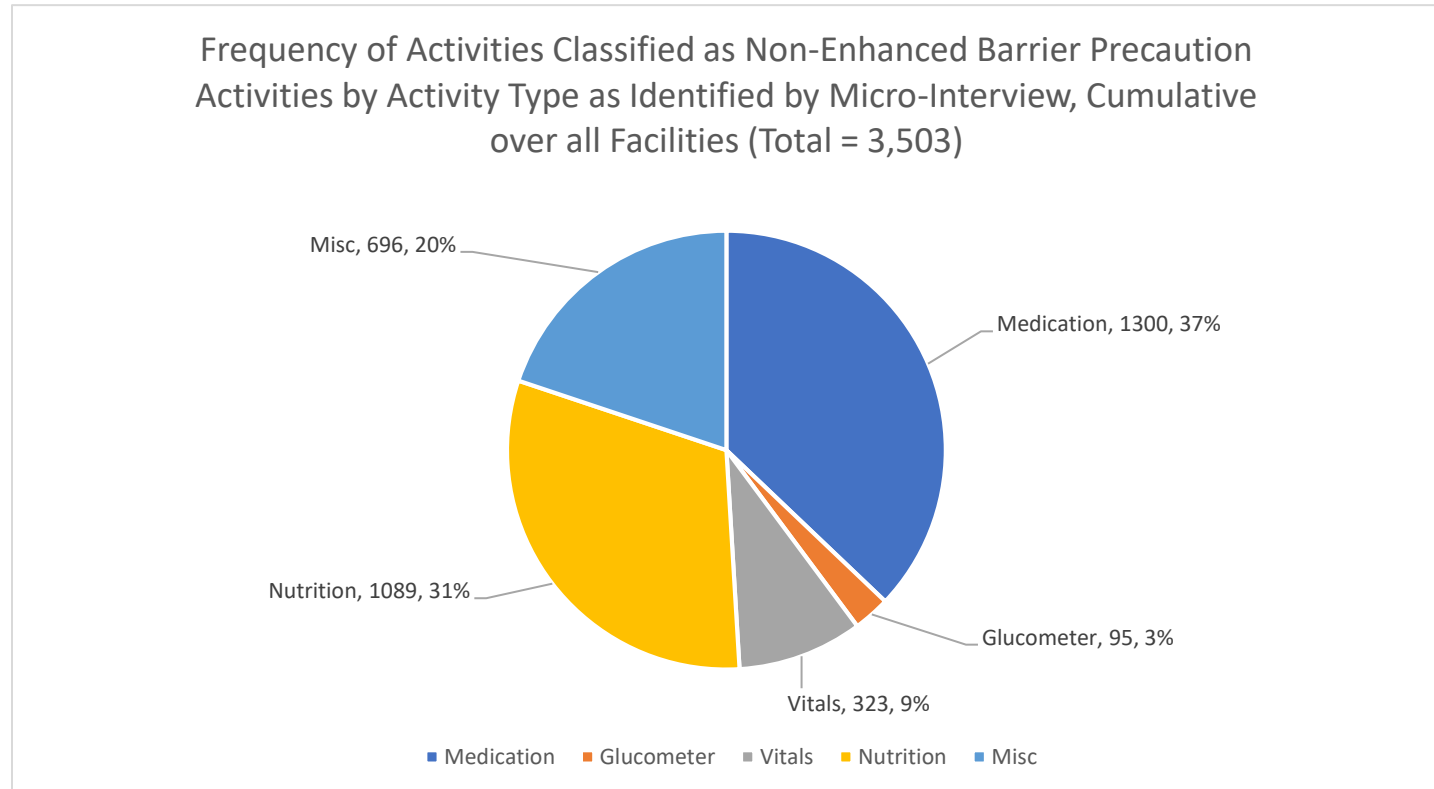


Table 1.

| | <u>HCW Type</u> | <u>All Sites</u> | | <u>Geographic Location</u> | | | | | |
|----------------------|-----------------|------------------|----------|----------------------------|----------|-----------|----------|-----------|----------|
| | | <u>N</u> | <u>%</u> | <u>GA</u> | <u>%</u> | <u>NY</u> | <u>%</u> | <u>TN</u> | <u>%</u> |
| HCWs Observed | Total | 1455 | - | 560 | - | 583 | - | 312 | - |
| | CNA | 890 | 61% | 364 | 65% | 369 | 63% | 157 | 50% |
| | Nurse | 565 | 39% | 196 | 35% | 214 | 37% | 155 | 50% |
| | | | | | | | | | |
| | | <u>N</u> | <u>%</u> | <u>GA</u> | <u>%</u> | <u>NY</u> | <u>%</u> | <u>TN</u> | <u>%</u> |
| All EBP Activities | Total | 4072 | - | 1625 | - | 1445 | - | 1002 | - |
| | CNA | 3807 | 93% | 1554 | 96% | 1328 | 92% | 925 | 92% |
| | Nurse | 265 | 7% | 71 | 4% | 117 | 8% | 77 | 8% |
| | | | | | | | | | |
| Hygiene | Total | 905 | - | 335 | - | 353 | - | 217 | - |
| | CNA | 863 | 95% | 330 | 99% | 334 | 95% | 199 | 92% |
| | Nurse | 42 | 5% | 5 | 1% | 19 | 5% | 18 | 8% |
| | | | | | | | | | |
| Dressing | Total | 829 | - | 372 | - | 276 | - | 181 | - |
| | CNA | 807 | 97% | 366 | 98% | 270 | 98% | 171 | 94% |
| | Nurse | 22 | 3% | 6 | 2% | 6 | 2% | 10 | 6% |
| | | | | | | | | | |
| Transfer | Total | 1099 | - | 421 | - | 425 | - | 253 | - |
| | CNA | 1011 | 92% | 395 | 94% | 384 | 90% | 232 | 92% |
| | Nurse | 88 | 8% | 26 | 6% | 41 | 10% | 21 | 8% |
| | | | | | | | | | |
| Wound Care | Total | 75 | - | 30 | - | 27 | - | 18 | - |
| | CNA | 13 | 17% | 7 | 23% | 1 | 4% | 5 | 28% |
| | Nurse | 62 | 83% | 23 | 77% | 26 | 96% | 13 | 72% |
| | | | | | | | | | |
| Stool Cleanup | Total | 602 | - | 215 | - | 245 | - | 142 | - |
| | CNA | 568 | 94% | 206 | 96% | 228 | 93% | 134 | 94% |
| | Nurse | 34 | 6% | 9 | 4% | 17 | 7% | 8 | 6% |
| | | | | | | | | | |
| Linen changing | Total | 542 | - | 250 | - | 148 | - | 144 | - |
| | CNA | 534 | 99% | 250 | 100% | 146 | 99% | 138 | 96% |
| | Nurse | 8 | 1% | 0 | 0% | 2 | 1% | 6 | 4% |
| | | | | | | | | | |
| All Other Activities | Total | 3503 | - | 1373 | - | 1208 | - | 922 | - |
| | CNA | 1646 | 47% | 738 | 54% | 540 | 45% | 368 | 40% |
| | Nurse | 1857 | 53% | 635 | 46% | 668 | 55% | 554 | 60% |

Figure 2.

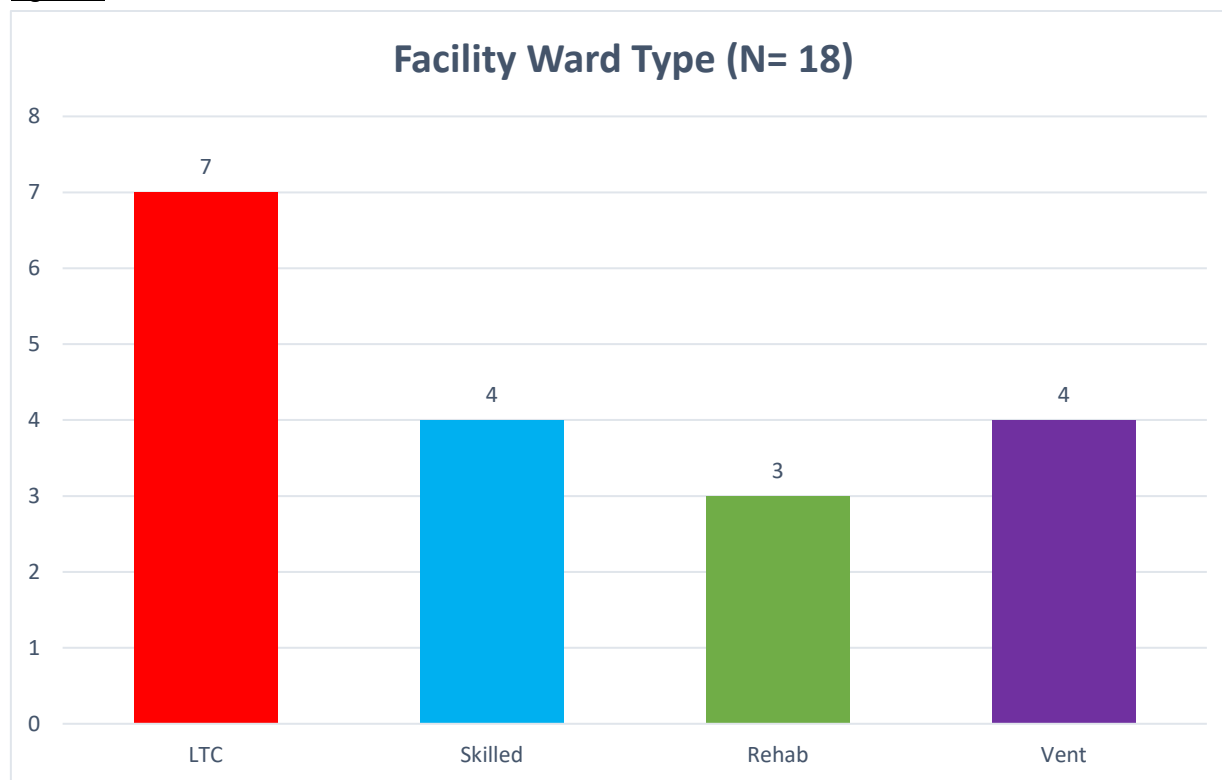


Figure 3A.

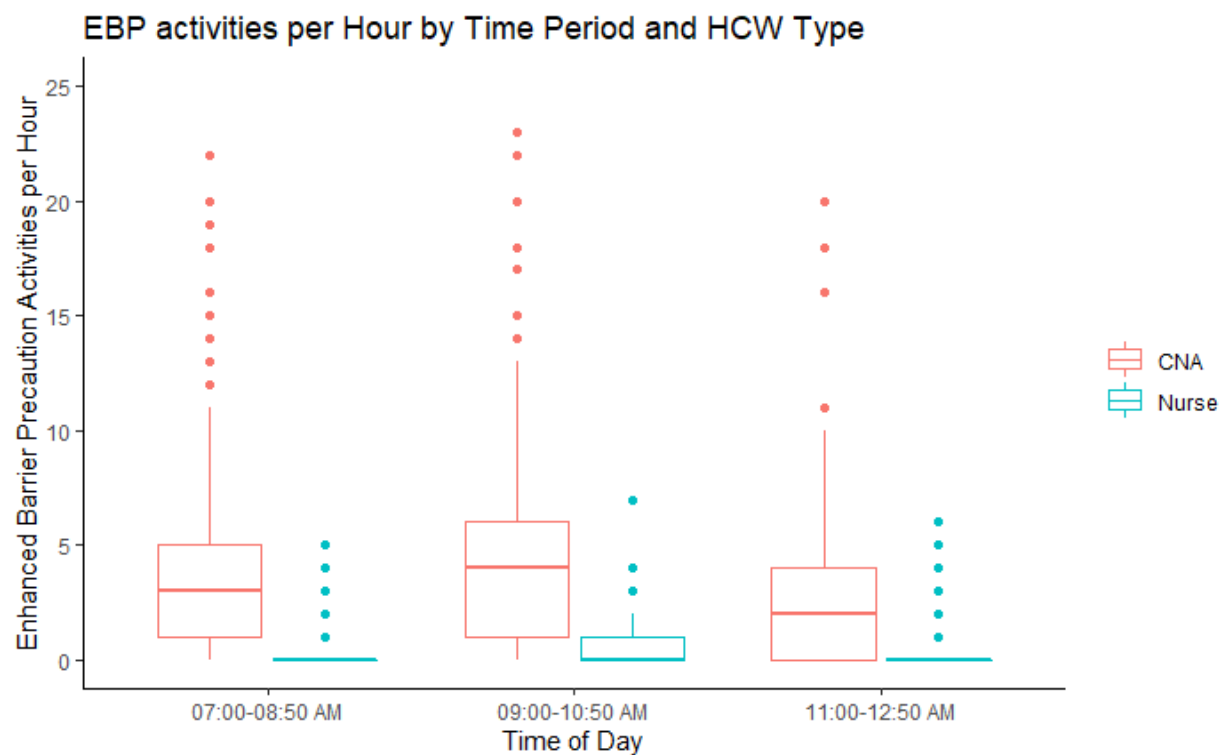


Figure 3B.

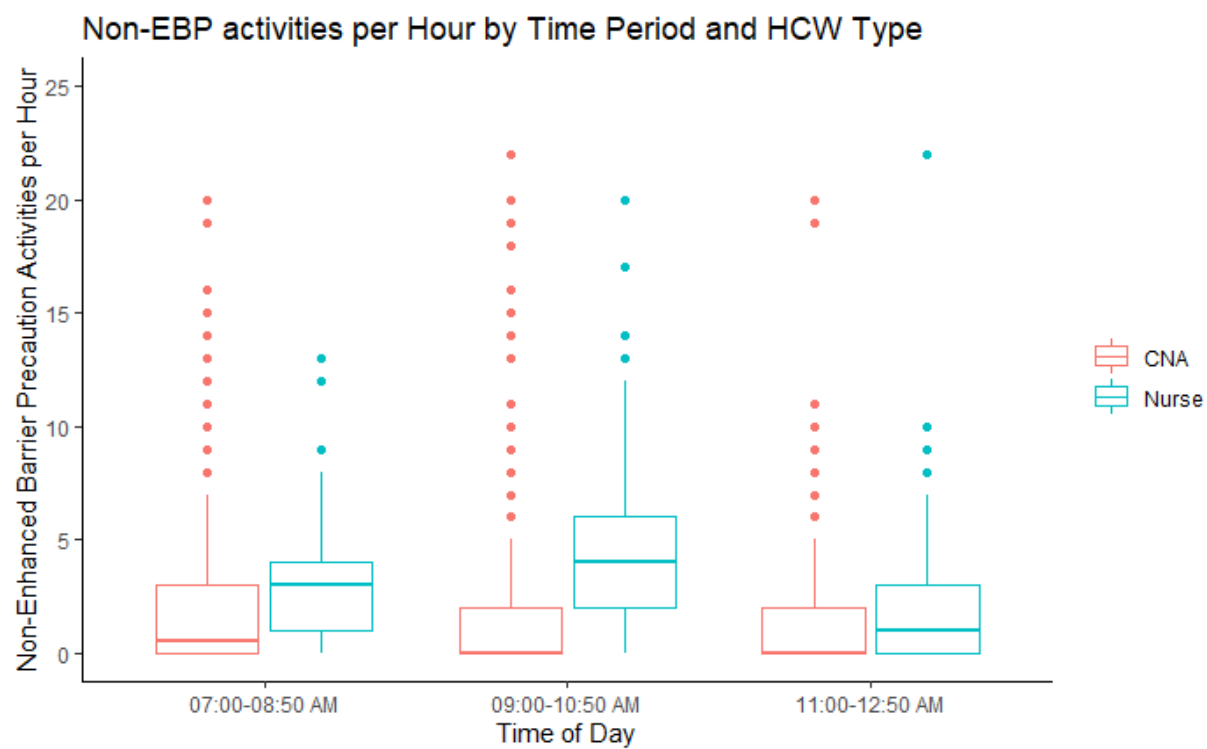


Figure 4A.

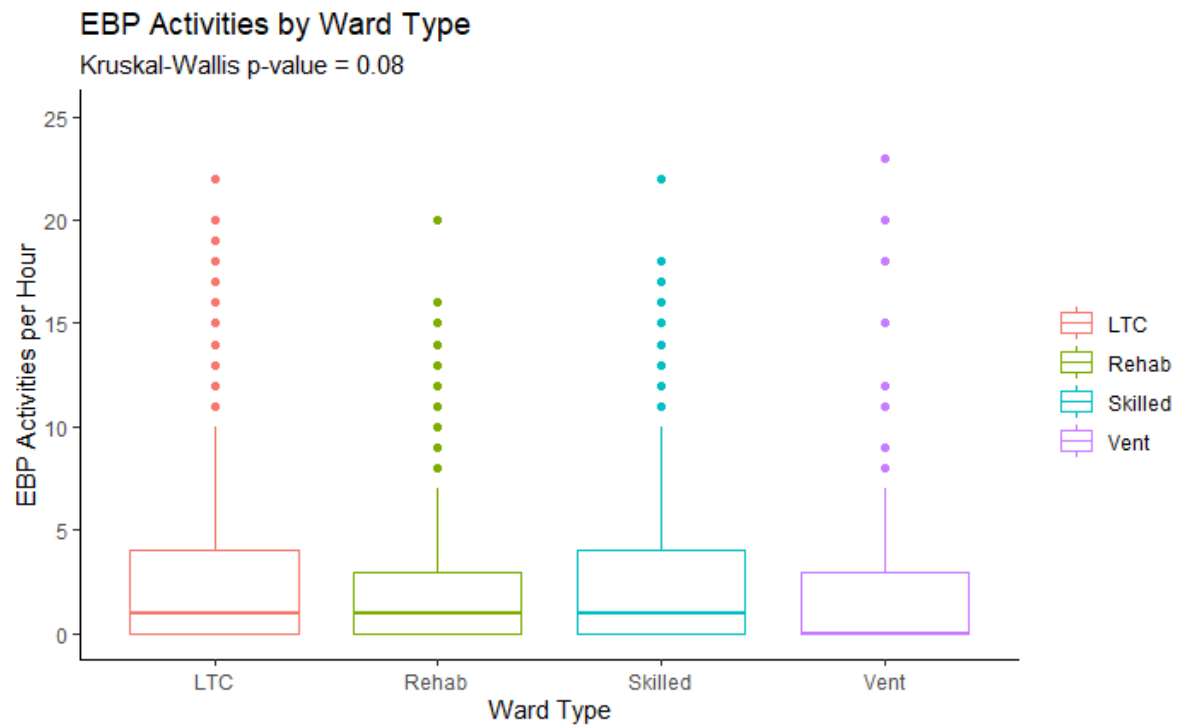
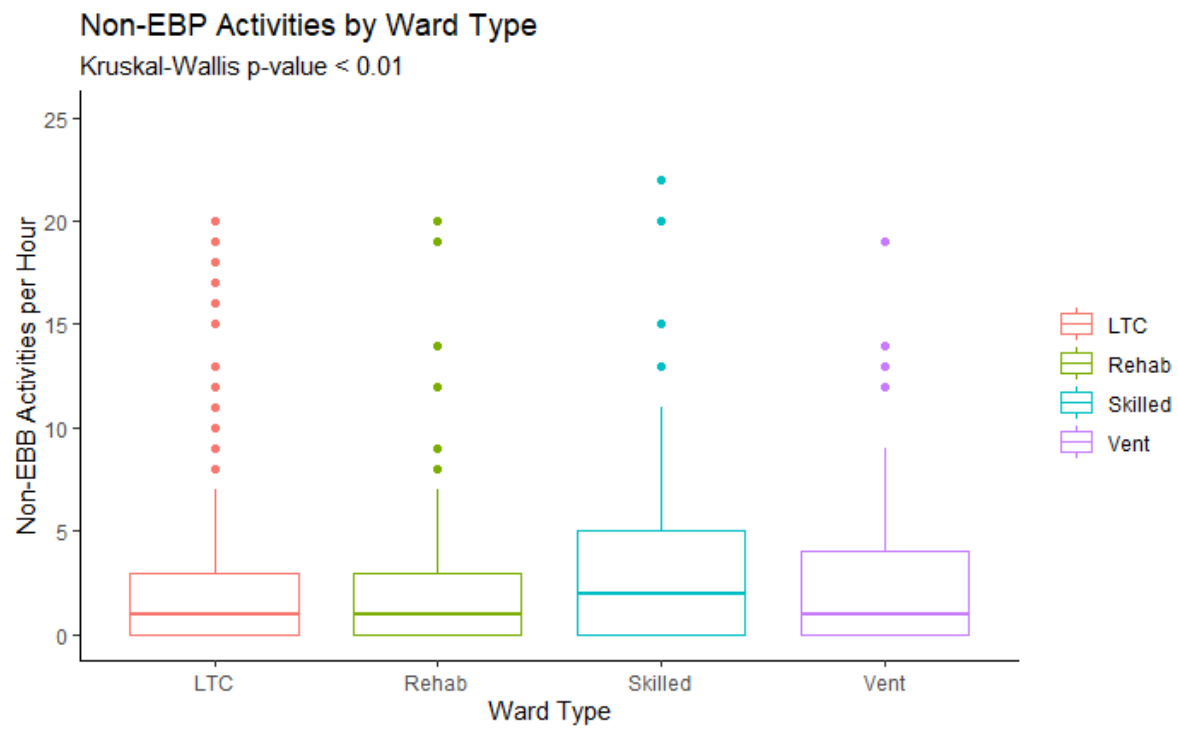


Figure 4B.



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