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Registered Nurses' Decisions Around Referral of Residents With Urinary Tract Infections: A Retrospective Cohort Study

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Abstract

Background: Referral of residents with urinary tract infections (UTIs) in residential aged care facilities (RACFs) to hospital are common. However, there is limited information on what influences Registered Nurses' (RN) decision-making process. **Aim:** To investigate resident factors that influence RN's decisions to escalate care. **Design:** A retrospective cohort approach audited electronic clinical records of residents with UTIs. **Methods:** Data were extracted from the electronic database and analyzed using descriptive and regression analysis. Approval was obtained from both the RACFs and University Human Research Ethics Committee. **Results:** There was a higher likelihood of being referred to hospital if residents were female, had had a past fall, had related comorbidity, or had abnormal vital signs. However, being older and having a urinary catheter were protective factors for referral by the RN. **Conclusion:** Referral of residents with UTIs by RNs to hospital is common in RACFs. Resident characteristics such as abnormal vital signs, past falls, and presence of comorbidity influence referrals by RNs. Nurse Practitioners dedicated to the RACFs could complement the role of a general practitioner. UTI-specific escalation protocols can assist RNs to make decisions about referrals. RNs' related risk factors also need to be examined to understand other influencing factors.

Keywords

urinary tract infection, registered nurses, residential aged care facilities, older people, unplanned hospital admissions

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Summary of Relevance

Problem: RNs are the main professionals responsible for escalation of care of residents in RACFs, yet it is unclear what influences their decisions to refer residents to hospitals.

What is already known: UTIs in RACFs are a common problem that could lead to unplanned hospital admissions.

What this paper adds: Residents' factors such as abnormal vital signs, past falls, and presence of comorbidities significantly influence RNs' decision to refer residents to hospital following an UTI episode. The findings suggest there is need for a Nurse Practitioner dedicated to the RACFs to complement the role of a general practitioner and for introduction of UTI-specific care escalation pathways tailored for RNs. Also, more intensive prevention strategies for residents at high-risk UTIs are needed to reduce unplanned hospital transfers.

Introduction and Background Literature

The incidence of UTIs among residents in RACFs is high. UTIs form the third most prevalent acquired infection, and the second-highest cause for unplanned hospitalizations after respiratory infections for residents in RACFs.[1] The prevalence of UTIs also increases with age, with about 20% of RACFs residents reporting at least 1 episode of UTI by the age of 65 years and 50% of women and 23% men by the age of 80.[2]

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Urinary tract infections have been linked to untoward clinical and care outcomes, such as falls,[3] delirium,[4] and consequently, to unplanned hospital admissions.[5] A report by Australian Institute of Health and welfare (AIHW) from 2016 to 2017 hospital data shows that, urinary tract infections accounted for 23% of acute conditions potentially preventable hospitalizations (PPH) among the elderly.[6]

In Australia, PPHs are used as a measure of access to timely, effective, and appropriate primary and community health care. They are hospital admissions that could potentially have been avoided through preventative health interventions (such as vaccination), or appropriate individualized disease management (such as treatment of infections or management of chronic conditions) in the community.[6] Although classifying a hospitalization as "potentially preventable" does not mean that the hospitalization itself was unnecessary, the AIHW suggests that optimal management at an earlier stage might have prevented the patient's condition worsening to the point where they needed hospitalization. This study examined health problems that RNs report at the time of referring a resident with UTI to hospital. By examining such factors there is potential to identify problems that could be addressed by a nurse practitioner or a general practitioner (GP) at the RACF level.

RNs are the community health professionals accountable for the care of residents in RACFs in Australia.[7] In 2014, about 15% of the workforce providing direct care to residents in Australian RACFs were RNs, and this number is expected to grow.[7] So far, there is no requirement for RNs entering RACFs workforce to have a specialty in gerontology nursing[8] yet they are responsible for recognizing the deterioration of residents' conditions and escalating of their care.[9] It is, therefore, crucial that RNs working in community RACFs are supported to manage the care of residents with UTIs.[10]

So far, there are no standardized protocols for RNs to use when making decisions about referring residents with UTIs in RACFs. The existing consensus criteria that are used to diagnose UTIs in older adults, such as Loeb's criteria[11] and McGeer's criteria,[12] are inconsistently applied in RACFs and have been documented as not optimal as decision aids for care escalation by RNs.[13] Therefore, escalation of care for residents with UTIs in RACFs is mainly at the discretion of RNs, which may lead to preventable unplanned hospital presentations.[14] An RN's ability to make a complete assessment of a resident's condition in order to make decisions about referral is further complicated by factors, such as communication difficulties in cognitively impaired residents.[15-17] So far, there is a glut of information on protocols used by RACF physicians and primary care providers, but there is a lack of evidence in the existing literature to show what issues RNs consider to be alarming before escalating the care of a resident with a UTI from the community RACFs hospital. Studies that involve RNs have mainly focused on RNs as part of the multidisciplinary primary care team health care team involved in diagnosing UTIs,[13,18] but there is limited information on what factors influence RNs' decisions when making referrals for residents with UTIs. Therefore, this study conducted a retrospective review of records of residents with UTIs to explore the information RNs report at the time of diagnosis and before escalating the care of these residents to hospital. In the 4 RACFs in which this study was carried out, RNs are responsible for escalating the care of a resident to a GP, nurse practitioner, or hospital. When an event (referral) occurs, it is usually categorized by the facility as an incident and consequently recorded in an electronic database by an RN. Each index incident recorded in the database and the associated clinical profile at the time of the reporting was collated to explore the factors documented by RNs when referring residents.

Study Aims and Objectives

The overall aim of this study was to assess the demographic and clinical factors of residents who experienced UTI between January 1, 2018 to June 30, 2019 to (1) examine common clinical and demographics factors recorded by RNs at the time of reporting and (2) compare the profiles (demographic and clinical) of residents who were referred to hospital by the RNs and those that were not referred to examine the factors RNs consider as important when referring residents to hospital.

Methods

Design

This was a retrospective cohort study involving a retrospective review of medical records. This design involves looking back at events that have already happened and where data has been recorded in a database.[19] The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement was used to guide the framework of this paper.[20] The design incorporates background review of literature and rationale for the study; study methods such as design, setting, participants, data variables, and sources; how sample size was reached, and the method of handling variables in the analysis; presentation and discussion of the results (see Supplemental File 1).

Study Setting

The study was carried out in 4 RACFs in Perth, Western Australia. The first facility had a bed capacity of 112; the second facility had 120 beds; the third facility had 59 beds, and the fourth facility had 37 beds.

Sample Size

The incidence of UTIs in older people is about 44% to 50% in every 100 residents in RACFs.[17] An a priori power analysis for chi-square tests was conducted using G*Power3,[21] power = 0.80 large; $df = 7$ effect size ($d = .50$), and an alpha of .05. Results showed that a total sample of 58 participants was required to achieve a power of .80. So, it was expected that around 101 of the 328 residents in the 4 RACFs would experience at least 1 UTI in any given year. Based on a prevalence of 50%, a sample size of 56 in each group ("referred" and "not referred" to hospital by an RN) was deemed sufficient to obtain significant differences between the 2 groups, with a power 80% and P value .05.[22]

Data Collection

Records were included for the study if (1) A UTI incident was recorded; (2) resident's age was 65 years and above (to meet the classification of an older adult according to the Australian standards)[7]; (3) was residing permanently at the participating RACFs. Consecutive records that met the inclusion criteria were extracted from the electronic database and reviewed. Data were obtained in September 2019 and for the period of January 1, 2018, to June 30, 2019.

Data extraction was informed by empirical evidence. The variables that were reported by 6 or more of the 11 studies that were reviewed were included in the data extraction sheet (see Table 1). Variables such as fever + abnormal vital signs, dysuria/burning on urination, urinary frequency, urgency, change in mental status, change in gait/falls, pyuria, rigors, increased urinary incontinence, suprapubic/pelvic pain, hematuria, and positive nitrites. "Family pressure" was also extracted as an additional factor that could influence RNs' decision to escalate care further.[23] In the context of this study, "family pressure" refers to influence of the family on the RN's decision to transfer or not to transfer a resident to hospital.

Data Analysis

Data were analyzed using IBM SPSS software.[28] Variables such as gender, diagnosis, and comorbidities, were presented as frequencies and counts for categorical variables. Continuous variables, such as age and length of stay in RACFs, were explored using measures of central tendencies, such as mean and standard deviation. Pearson's chi-square for categorical variables and an independent sample t-test for continuous variables were used to examine characteristics of residents whose care was escalated by RNs. The clinically pertinent variables—abnormal vital signs/fever, and family involvement (included in data extraction sheet (Table 1)) and those identified in the preliminary analysis through chi-square and t-tests as significant (gender, age, comorbidity, presence of an indwelling catheter) were entered into the General Linear Model, binary logistic regression, forward step approach to predict referrals. P value for significant variables was set at .05.

Ethical Considerations

Ethical and letter of approval were granted by the University Human Research Ethics Committee (HRE 2019-0605) and the participating RACFs respectively. This study did not include any interactions with the study participants, and all data were de-identified to prevent breaching confidentiality. No identifying information, such as residents' names or medical record numbers, was collected.

Results

Participants' Demographic and Clinical Profile

Table 2 shows the demographic and clinical profile of the 234 cases of UTIs that were extracted from health records. Of the 234 UTI cases, 83.3% (n = 195) involved female residents and 16.7% (n = 39) involved males. The average age of residents was about 87 years (M = 87.30, SD = 5.08), and length of stay in the RACF was about 45 months (M = 45.19, SD = 30.17). Of the 234 cases, only 23.9% (n = 56) were referred to hospital by RNs following the UTI episode, 12% (n = 28) a family was involved in the decision making by the RN at the time of referral, and 28.5% (n = 90) had comorbidity relevant to UTI (diabetes, kidney diseases, prostatic hypertrophy, urinary, and fecal incontinence).

Most cases (86.3%, n = 202) had at least 1 documented adverse behavior (wandering, aggression, agitation, confusion) (M = 1.98, SD = 1.16) and reported abnormal vital signs (temperature, heart rate, oxygen saturation, respiratory rate, blood pressure) (86.3%, n = 202). However, only 13.7% (n = 32) had a related pain (pelvic and/or suprapubic) documented. The dipstick results completed by RNs at the facilities revealed abnormal findings in 74.8% (n = 175) of the cases. Nearly all cases had their abnormal midstream urine (MSU) results confirmed through laboratory tests (99.6%, n = 233).

Factors That Influence RNs' Decisions to Refer Residents to Hospital Following UTI Episodes

Pearson's chi-squared test and the independent t-test identified gender, age, abnormal vital signs, comorbidities, presence of an IDC/SPC, past referrals by RN, and more ACAT (Aged Care Assessment Tool—the level of need) items as factors that influenced RNs' decision to refer residents to hospital. The preliminary analysis across both groups revealed that, more females (22.6%, n = 53) were referred to

Table 1. Signs and Symptoms of UTIs That Required Further Action Based on Empirical Evidence.

Author/country	UTIs treatment protocol	Mental status change/ change in gait	Loss of appetite	Fever	Rigors	Dysuria / burning on urination	Urinary frequency	Urinary urgency	Urinary incontinence	Foul smell of urine	Bladder distention	Suprapubic pain/pelvic pain	Costovertebral/ lumbar tenderness	Increased BSL in diabetes	Pyuria in U/A (positive leukocyte esterase)	Hematuria	U/A positive nitrites
D'Agata et al,[15] USA	SHEA guidelines	✓		✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
Avelluto and Bryman,[23] USA	Not reported	✓		✓											✓		✓
Gavazzi et al,[24] France	Not reported	✓		✓	✓	✓	✓		✓		✓	✓	✓			✓	
Gbinigie et al,[25] UK	Not reported	✓										✓				✓	
Juthani-Mehta et al,[18] USA	Loeb's criteria	✓		✓		✓	✓	✓							✓		✓
Juthani-Mehta et al,[13] USA	McGeer and Loeb's criteria with laboratory evidence	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓
Juthani-Mehta et al,[26] USA	Used clinical reasons for suspicion of UTI	✓		✓		✓	✓	✓		✓		✓			✓		✓
Loeb et al,[11] USA	Loeb criteria	✓		✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	
Lohfeld et al,[16] USA	Clinicians' consensus on Loeb's criteria		✓	✓		✓	✓	✓	✓	✓				✓			
Ryan et al,[17] Australia	Not reported	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Schmiemann et al,[27] Germany	Various diagnostic algorithms					✓	✓	✓		✓		✓			✓	✓	✓
Total		9	3	9	5	9	9	8	5	4	3	7	4	3	8	6	6

Abbreviations: BSL: blood sugar level; UA: urinalysis.

Table 2. Demographic and Clinical Data of Cases of UTI Cases in RACFs (January 2018-June 2019), n = 234.

Demographic variables	n (%)	Mean (SD)
Age—years		87.30 (5.08)
Length of stay in months		45.19 (30.17)
Gender		
Male	39 (16.7)	
Female	195 (83.3)	
Number of ACAT items		6.50 (0.85)
Presence of relevant comorbidity		
Relevant comorbidity reported	90 (38.5)	
No relevant comorbidity reported	144 (61.5)	
Clinical variables	**n (%)**	**Mean (SD)**
Falls		
Yes	83 (35.5)	0.78 (1.49)
No	151 (64.5)	
Previous hospital referrals		
Referred	56 (23.9)	
Not referred	178 (76.1)	
Adverse behaviors		
Yes	202 (86.3)	1.98 (1.16)
No	32 (13.7)	
Vital signs		
Abnormal vitals reported	123 (52.6)	
No abnormal vitals reported	111 (47.4)	
Related pain		
Related pain reported	32 (13.7)	
Not reported	202 (86.3)	
Dipstick results		
Abnormal results reported	175 (74.8)	
No abnormal results reported	59 (25.2)	
MSU results by pathology		
Abnormal results recorded	233 (99.6)	
No MSU lab results recorded	1 (0.4)	
Had and IDC or SPC in situ		
IDC/SPC in situ	36 (15.4)	
Not reported	198 (84.6)	
Family involved during referral		
Involved	28 (12)	
Not involved	206 (88)	

Abbreviations: ACAT: Aged Care Assessment Tool—the level of need; MSU: midstream urine; UA: urinalysis.

hospital than males (1.3%, n = 3), and this difference was statistically significant ($\chi^2 = .009$, $d = 1$, $P = .007$). Age of the resident was also seen to influence this relationship significantly, with younger residents (M = 87.68, SD = 5.27) being referred to hospital more frequently than older ones (M = 86.11, SD = 4.25) ($t = -2.093$, $d = 113$, $P = .043$). The results also show that more cases with relevant comorbidity were referred to a hospital (16.2%, n = 38) than those without (7.7%, n = 18), and the difference was also statistically significant ($\chi^2 = .000$, $d = 1$, $P < .001$). Likewise, statistically significant differences were noted for abnormal vital signs (18.4%, n = 43) compared to normal vital signs (5.6%, n = 13), with more cases of abnormal vital signs being referred to hospital ($\chi^2 = .000$, $d = 1$, $P < .001$). This trend was, however, reversed for patients with IDC or suprapubic catheter (SPC) in situ. Fewer cases with IDC or SPC were referred to hospital (referred 6%, n = 14; not referred 17.9%, n = 42) and this difference was statistically significant ($\chi^2 = .022$, $d = 1$, $P = .032$). Statistically significant differences were also noted in the number of emergency referrals made by RNs in the past. There was a relationship between a "past referral" by an RN and a "future referral" being made (M = 1.5, SD = 0.894, $t = 22.48$, $d = 55$, $P < .001$). Also, more cases with a higher number of reported ACAT items were referred to hospital

Table 3. Logistic Regression Results of Factors That Influenced RN Decisions to Refer a Resident to Hospital Following a UTI Episode.

								95% CI for OR	
		B	SE	Wald	*df*	Sig.	OR (odds ratio)	Lower	Upper
Steps a-g*	Gender	2.525	0.786	10.313	1	0.001	12.486	2.675	58.292
	Age in years	−0.092	0.043	4.594	1	0.032	0.912	0.839	0.992
	Number of falls since admission	0.518	0.261	3.955	1	0.047	1.679	1.008	2.799
	Presence of a relevant comorbidity	2.338	0.429	29.653	1	0.000	10.358	4.465	24.028
	A record of abnormal vital signs	1.111	0.392	8.011	1	0.005	3.037	1.407	6.552
	Had and IDC or SPC in situ	2.147	0.599	12.851	1	0.000	8.559	2.646	27.684
	If family was involved during the referral	−23.151	6389.687	0.000	1	0.997	0.000	0.000	
	Constant	−0.714	4.131	0.030	1	0.863	0.490		

Abbreviations: B: intercept; *df*: degrees of freedom; SE: standard error; Wald: chi-square test.
*Seven step logistic regression (Method = Forward Step (LR)).
a. Variable(s) entered on step 1: Presence of relevant comorbidity.
b. Variable(s) entered on step 2: If family was involved during the referral.
c. Variable(s) entered on step 3: Presence of abnormal vital signs.
d. Variable(s) entered on step 4: Gender.
e. Variable(s) entered on step 5: Had an IDC or SPC in situ.
f. Variable(s) entered on step 6: Age in years.
g. Variable(s) entered on step 7: Number of falls since admission.

(M = 6.80, SD = .52) compared to those with fewer ACAT items (M = 6.80, SD = 6.40). This difference was statically significant ($t = 3.139$, $d = 164$, $P = .002$).

Table 3 shows the results of a binary logistic regression analysis of the factors that were considered by RNs for referrals. Only adjusted results have been reported. Only the age of the resident, gender, and number of falls, presence of related comorbidity, abnormal vital signs, and absence of an IDC/SPC affected the likelihood that an RN would make a referral to hospital. Factors such as family pressure did not influence the chance that an RN would escalate a resident's care. The results show that with every increase in a year of resident's age, there was a less chance that the RN would refer the resident (OR = 0.91; 95% CI: 0.839-0.992, $P = .032$). Also, female residents were nearly 12 times more likely to be referred for emergency care compared to males (OR = 12.48; 95% CI: 2.675-58.292, $P < .001$). There was also a higher likelihood of being referred by the RN if a resident had more falls in the period preceding the UTI episode. In this case, there was a nearly 70% increased chance that an RN would refer a resident for emergency care if they had experienced a fall in the past. Residents with related comorbidities, such as kidney disease, prostate hypertrophy, or diabetes, were 9 times more likely to be referred to hospital by an RN (OR = 10.36; CI: 4.46-24.03, $P < .001$).

Similarly, residents with abnormal vital signs were twice likely to be referred to hospital (OR 3.037; 95% CI: 1.407-6.552; $P = .005$) compared to those with normal vital signs. On the contrary, the presence of an IDC/SPC was a protective factor for referral. Residents without an IDC/SPC were nearly 8 times more likely to be referred (OR = 8.559; 95% CI: 2.646-27.684; $P < .001$) compared to those with an IDC/SPC.

Discussion of Results

This study reviewed records of residents with UTIs in RACFs to explore factors that RNs' consider as important before referring residents for care in a hospital. Our results show that nearly a quarter of the cases (23.9%) were referred to hospital for further management. The number of UTIs cases that were referred to hospital was above the national average for unplanned referrals for residents with acute conditions. According to a report by the Australian Institute of Health and Welfare, 2018, a third of the potentially preventable hospitalizations were due to acute conditions, and UTIs accounted for only 23% of these.[6] Given the number of residents referred to hospital in this study was much higher than the national average, the results indicate there is room to address potentially preventable referrals at the level of RACFs by expanding the role of the Nurse Practitioner in these facilities.

Our results further show that multiple demographic and clinical factors such as gender of the resident, age, past falls, and abnormal vital signs influenced the RNs' decisions to escalate care of a resident to a hospital. Analysis of the demographic data showed that there was a higher likelihood of a resident being referred from the community RACFs to the hospital if they were female ($P = .001$). These results agreed with those of a 2018 Australian government report that showed that the most common cause of potentially preventable hospitalizations for older women (older than 65 years) was urinary tract infections but for men was chronic obstructive pulmonary disease.[6]

Our study further identified that older residents were less likely to be referred to hospital than younger ones ($P = .03$). This study was, however, unable to ascertain why the odds of a resident's care being escalated decreased with their age. Given the high prevalence of UTIs in older residents in this study, further exploration as to the cause of this decline in care needs to be conducted. However, it is likely that younger residents preferred to go to hospital if any problems arose with their health compared to the older residents, who may have wished to have palliative care, according to their advanced care plan.[29]

Residents with related comorbidities, such as kidney disease, prostate hypertrophy, or diabetes, were also more likely to be referred to hospital than residents without relevant comorbidities ($P < .001$). These results agreed with those of other studies, that found that around 40% of residents who were referred to emergency department with UTIs had kidney and urological diseases,[30] and had diabetes.[13,16,17,30] On the contrary, residents with an IDC/SPC were less likely to be referred for emergency treatment than those without an IDC/SPC. It is possible that the clinical presentation of the residents who had an IDC/SPC and also experienced a UTI episode did not warrant care escalation according to the RN's clinical judgment. Further research to explore the RNs' perspective of this aspect should be carried out.

The results of this study further identified that abnormal vital signs were a strong predictor of RNs' decision to refer residents to hospital ($P = .005$). Such an outcome would be expected given the widespread usage of standardized clinical protocols for care escalation regarding abnormal vital signs in Australia.[31] Similarly, there was an increased tendency for residents to be referred to hospital if they had a higher number of past falls ($P = .05$). This finding is concurrent with the data that suggests UTIs could increase the risk of falls and further health deterioration of older adults, prompting escalation of care.[17] Also, 9 studies that informed the data abstraction in this study included abnormal gait as important factor to consider when escalating care of a resident.[11,13,15,17,18,23-26] It is, therefore, possible that the RNs' clinical evaluation of the resident, coupled with the possibility that another fall might happen during the UTI episode, triggered the RN to refer the resident to reduce the risk of a fall happening.

Limitations of the Study

This study was completed in RACFs in Western Australia, the results may not be applicable to other settings with different primary care health system arrangements. Also, due to smaller number of cases that were males, and those that had IDC/SPCs, interpretation of these 2 variables should done cautiously. Larger studies are needed to determine if a similar effect would be replicated.

Relevance to Clinical Practice and Policy Making

Considering that 1 in every fourth case of the UTI in this study was referred to the hospital for further care and that most RACFs have an external consulting GP,[32] the findings of this study suggest that several areas require strengthening to improve patient care outcomes in this setting. Our study suggests introduction or expansion of the role of a Nurse Practitioner in the RACFs to complement the role of the GPs.[33] The role of a Nurse Practitioner in RACFs has been reported elsewhere to reduce the risk of hospitalizations and improve quality outcomes among nursing facility residents.[33]

Additionally, RN staffing and skill-mix need to be carefully considered in RACFs. Staffing levels and skill-mix have been considered elsewhere as important factors that influence RNs' escalation of care for residents.[9] Laging et al indicated that irregularly rostered nursing staff or visiting RNs at a RACF may be unfamiliar with a residents' usual presentation and therefore more likely to refer a resident for further management. Although our study did not assess each facility's staffing pattern during each UTI episode because it was not feasible to obtain the records retrospectively. However, our study suggests the use of RN tailored UTI protocol to guide RNs' wanting to make referrals. The standardized protocols may also be useful for non-regular RNs who may not be familiar with the residents or when there is poor skill-mix, which can often happen. Familiarity with residents has been documented in other studies as relevant to recognizing resident deterioration.[9] Deployment of standardized protocol has been trialed elsewhere with higher satisfaction among health care professionals.[16]

Further, our study recommends that clinical records of residents with recurrent UTIs, who have experienced a fall in past and have an existing comorbidity, such as diabetes, kidney diseases, prostatic hypertrophy, or urinary or fecal incontinence, should be clearly flagged and recorded on the resident's care plan for a more intensive follow-up in order to reduce the risk of preventable referrals to the hospital. These records need to be made accessible to all health staff to make them aware of the increased risk of deterioration.

Conclusion and Implications for Further Research

The findings of this study show referral of residents with UTIs from RACFs by RNs to hospital is common. Factors that RNs consider before referrals include age, gender, falls, abnormal vital signs, and comorbidities influence. These results recommend support systems to be put in place to support the RNs in RACFs. Our findings suggest RACFs to expand the role Nurse Practitioner to complement the GP; use of UTI-specific care escalation protocols to support RN decision making; and flagging records of high-risk residents

for more intensive preventive strategies. Further, research on RN- and facility-related factors that might influence RNs' decisions needs to be carried out.

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Author Contributions

Ludmila Kosheleva: Conceptualization, methodology, writing-draft preparation; Irene Ngune: Methodology, data curation, writing-draft preparation, reviewing, and editing.

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Supplemental Material

Supplemental material for this article is available online.

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