



ORIGINAL ARTICLE

Nurses' perceptions regarding transitional care for adolescents and young adults with childhood-onset chronic diseases

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Abstract

Aim: Nurses are expected to have a role in the transition of care from pediatric to adult medical practices for adolescents and young adults with childhood-onset chronic diseases. This study compares the experience, knowledge, and perceptions regarding the ideal care among adult unit and pediatric nurses regarding the transition to adult care for those with childhood-onset chronic diseases.

Methods: A cross-sectional study using self-report questionnaires was conducted with nurses in a tertiary hospital in Tokyo. Questions were generated based on a literature review and expert discussion. Data from 1,064 participants were analyzed (adult unit nurses: $n = 959$, 90.1%; pediatric nurses: $n = 105$, 9.9%).

Results: Among 623 adult unit nurses who had care experience for adult patients with a childhood-onset chronic disease, 458 nurses (73.6%) were unaware of the concept of transitional care. As the obstructive factors for transition, pediatric nurses recognized problems in healthcare providers' attitudes and lack of transitional care coordinators, while the adult unit nurses emphasized the patients' wishes to continue to receive pediatric healthcare. Most adult unit nurses expected pediatric nurses to function as transitional care coordinators.

Conclusion: Adult unit and pediatric nurses had different perceptions of the barriers in transitioning children with chronic diseases to adult care. It is important to have educational programs focusing on transitional care for all nurses, both to enable pediatric nurses to improve transition readiness of children with chronic diseases and to offer adult patients with a childhood-onset chronic disease continuing support through adult unit nurses.

KEYWORDS

adolescent, nurses, perception, self-care, transition to adult care

Seigo Suzuki and Sachiko Kita contributed equally to this work.

1 | INTRODUCTION

The number of children with a chronic health condition has been increasing, partly due to improvement in perinatal and pediatric treatments (Perrin, Bloom, & Gortmaker, Perrin, Bloom, & Gortmaker, 2007). In Japan, over 100,000 children under the age of 19 years are diagnosed with chronic diseases (including leukemia, insulin-dependent diabetes mellitus, nephrotic syndrome, and congenital heart disease; National Center for Child Health and Development, 2012). Many children with chronic diseases (CCD) do not recognize the long-term health risks related to their diseases and therapy (Burkart, Sanford, Dinner, Sharp, & Kinahan, 2019). Additionally, CCD tend to experience difficulties in school, friendships, career choices, and marriage during adolescence, which is the time of transition to adult health care (Fisch et al., 2018; Nakamura et al., 2018). The transition of health care from pediatric to adult-based care for CCD is a topic of increasing practical importance.

Transitional care aims to encourage CCD to identify appropriate adult healthcare facilities and to learn how to make decisions concerning their disease and treatment, which could lead to improvements in their lifelong functioning and health (American Academy of Pediatrics, 2002; Blum et al., 1993). It aims to provide support for the entire process right from the preliminary stage of transition to the phase of adapting to adult health care (Betz, Lobo, Nehring, & Bui, 2013; Schwartz, Tuchman, Hobbie, & Ginsberg, 2011). Poorly managed transitions to adult care can result in worsening of health behaviors and negative post-transition outcomes, such as irregular medical visits, poor adherence to treatments, and the exacerbation of some laboratory parameters (Bloom et al., 2012; Gurvitz et al., 2013; Mackie et al., 2009; Rapley & Davidson, 2010). Appropriate transitional care can assist in the maintenance of long-term health for CCD.

Previous studies have identified factors associated with successful healthcare transition including the healthcare systems, the CCD, and medical staff. Interactions between CCD and transitional care coordinators may help in medication adherence and reduce unnecessary hospital readmissions (Annunziato et al., 2013; Holmes-Walker, Llewellyn, & Farrell, 2007). Further, psychosocial support for CCD is a critical component of transitional care. CCD might perceive the transition to adult healthcare to be complex, given the differences between pediatric and adult medicine, which can increase their anxiety (Stewart et al., 2014). CCD tend to prefer pediatricians than adult unit doctors due to their emotional bond with their pediatric healthcare providers (Ishida et al., 2011; Lugasi, Achille, & Stevenson, 2011). In addition, barriers for successful transitions include differences in patient care and poor staff

communication between adult and pediatric healthcare professionals (Bell, Ferris, Fenton, & Hooper, 2011; Huang et al., 2011). Healthcare professionals for adult patients may have fewer opportunities to learn about treating congenital diseases and facilitating healthcare transitions for CCD.

Nurses play an important role in providing transitional care, as they are frequently in contact with CCD and their families. Therefore, nurses can easily ascertain the health conditions and feelings of patients (Jalkut & Allen, 2009). Cooperation between nurses, such as sharing information and nursing plans about CCD, can be an essential component of providing consistent and appropriate transitional care (Watson, Parr, Joyce, May, & Le Couteur, 2011). However, there has been limited research focused on adult unit and pediatric nurses' experiences, knowledge, and the perceptions of the ideal care for transitional care.

The current study compares the nursing experiences, knowledge, and perceptions of ideal care between adult unit and pediatric nurses regarding transitional care. Identifying perceptions of transitional care among nurses could be helpful in developing effective training programs and providing seamless transitional care for CCD. The term "transitional care" in this study is defined as interventions that contribute not only to the transfer of CCD from child-oriented to adult-oriented healthcare systems but also to encourage the management of their own diseases (American Academy of Pediatrics, 2002). Individuals with intellectual disabilities were not included in the target group for transitional care in this study.

2 | METHODS

2.1 | Study design, setting, and period

A cross-sectional study using anonymous self-report questionnaires was conducted in a tertiary hospital with the function of a pediatric advanced emergency medical center in Tokyo, Japan, between December 2015 and January 2016. The facility has 37 departments and over 1,000 beds, including general practice, organ-specific, emergency, intensive care, palliative care, geriatrics, and pediatrics. The pediatric department has over 100 beds and five nurse units, including a pediatric unit, pediatric surgery unit, a pediatric intensive care unit (PICU), a neonatal intensive care unit (NICU), a growing care unit. As the research facility, we selected this large-scale general hospital, which includes pediatrics, because we considered it important to target nurses in all medical departments to which CCD could be transferred. This facility did not have educational programs on transitional care for staff nurses.

2.2 | Participants

Participants included all nurses in the hospital who fulfilled the following criteria: (a) having no major mental illness that might affect their responses to the questionnaire; (b) having the ability to understand and complete the questionnaire in Japanese; and (c) agreeing to complete the questionnaire.

2.3 | Procedures

A literature search was conducted using two electronic databases (MEDLINE and ICHUSHI for Japanese articles). Original studies published until 2000 were identified in order to investigate the current status of transitional care. The results of the review were shared with the research team (i.e., three nursing researchers and five registered nurse graduates). The selection of the questionnaire items and development of the questionnaire draft were completed after four review meetings. The preproduction questionnaire was discussed during the two joint meetings with clinicians and nursing researchers. The joint conference included family nursing researchers, pediatricians, a pediatric surgeon, a head nurse in pediatric outpatients, a pediatric clinical nurse specialist, and clinical psychologists. In this study, adult patients with child-onset chronic diseases were defined as patients who develop continuing symptoms during childhood and have a chronic course during adulthood. At the beginning of the questionnaire, the concept of transitional care as defined by the American Academy of Pediatrics is introduced (American Academy of Pediatrics, 2002).

The researcher contacted head nurses in all 53 units of the 37 departments and asked for their cooperation with the study by providing a written explanation to junior nurses within their departments. The questionnaire contained no information that could identify the respondents (e.g., names, addresses, or detailed affiliations), ensuring the anonymity of the participants.

2.4 | Measures

2.4.1 | Demographic characteristics

Participants were asked to report their age, gender, types of affiliation (adult care unit or pediatric unit), total years of clinical nursing experience, the number of nursing experiences that involved caring for patients under the age of 15 years and adult patients with childhood-onset chronic diseases. Additionally, questions on the content of nursing explanations to patients in their current

settings including knowledge about disease and symptoms, how patients can manage their medical conditions, and information about available healthcare systems and services were included.

2.4.2 | Nursing experiences, knowledge, and ideal care during transitional care

The questionnaire was based on a literature review that focused on identifying factors that facilitated and hindered transition (Fegran, Hall, Uhrenfeldt, Aagaard, & Ludvigsen, 2014; Lugasi et al., 2011). The authors used the model of interprofessional collaboration to select the items on the questionnaire (D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005). These items were determined through multidisciplinary discussions with medical professionals (including three pediatricians with over 10 years of clinical experience, two nursing administrators, a pediatric nurse specialist, two clinical psychotherapists, three nursing faculty members, and three graduate students with pediatric nursing experience) to ensure content validity.

2.5 | Statistical analyses

Descriptive statistics (n [%], M [SD]) were used to assess variables including demographic characteristics of all participants. Next, the variables related to perceptions of transitional care for adult unit nurses were compared with those for pediatric nurses using Fisher's exact test and Mann-Whitney U test. Statistical analyses were conducted using R ver. 3.5.1 (R Foundation for Statistical Computing, Vienna, Austria). p values $< .05$ were considered significant. Missing values were deleted.

2.6 | Ethics considerations

The ethics committee of the Graduate School of Medicine at the University of Tokyo approved the study protocol (No. 11043). Explanatory forms indicating the study purpose, the protection of participants' privacy, and voluntary participation were distributed to the participants along with the questionnaires.

3 | RESULTS

The questionnaire was distributed to 1,253 facility nurses and, 1,145 of them completed it (response rate: 91.4%). After 81 participants with incomplete responses were

TABLE 1 Participants' characteristics ($N = 1,064$)

	<i>n</i> (%) or median (interquartile range)						<i>p</i> ^b
	All (<i>N</i> = 1,064)		Adult unit nurses ^a (<i>n</i> = 959)		Pediatric unit nurses (<i>n</i> = 105)		
Gender ^c							.649
Women	1,001	(94.5)	900	(94.3)	101	(96.2)	
Men	58	(5.5)	54	(5.7)	4	(3.8)	
Age (years) ^c							.037 ^e
20–29	541	(50.9)	483	(50.4)	58	(55.2)	
30–39	301	(28.3)	271	(28.3)	30	(28.6)	
40–49	162	(15.2)	148	(15.4)	14	(13.3)	
50–59	54	(5.1)	51	(5.3)	3	(2.9)	
≥ 60	5	(0.5)	5	(0.5)	0	(0)	
Total years of nursing experience							.675 ^f
	5.75 (2.75–12.67)		5.83 (2.75–12.67)		5.75 (2.67–11.67)		
Total years of pediatric nursing experience							
	—		—		3.75 (1.75–7.54)		
Experience of nursing patients aged less than 15 years ^c							<.001
Not at all	169	(15.9)	169	(17.7)	0	(0)	
A couple of times	422	(39.8)	421	(44.0)	1	(1.0)	
Occasionally, but not usually	337	(31.8)	332	(34.7)	5	(4.8)	
Usually	133	(12.5)	34	(3.6)	99	(94.3)	
Nursing experiences for APCCD ^c							<.001
Not at all	385	(36.3)	336	(35.2)	49	(46.7)	
A couple of times	446	(42.1)	428	(44.8)	18	(17.1)	
Occasionally, but not usually	211	(19.9)	182	(19.1)	29	(27.6)	
Usually	18	(1.7)	9	(0.9)	9	(8.6)	
Contents of the explanations given to patients in usual settings ^d							
Knowledge about diseases and symptoms	942	(88.5)	853	(88.9)	89	(84.8)	.198
Managing their medical information	552	(51.9)	517	(53.9)	35	(33.3)	<.001
Information about available healthcare systems and services	501	(47.1)	472	(49.2)	29	(27.6)	<.001
Explaining own disease to others	111	(10.4)	97	(10.1)	14	(13.3)	.312
Effects of their disease on future pregnancy and childbirth	83	(7.8)	80	(8.3)	3	(2.9)	.053
Information about admission to school and job-hunting	63	(5.9)	45	(4.7)	18	(17.1)	<.001
Information about contraception	24	(2.3)	24	(2.5)	0	(0)	.159

Note: Adult patients with childhood-onset chronic disease (APCCD).

^aAdult unit nurses: nurses who work in an adult unit.

^bFisher's exact test between adult unit nurses and pediatric unit nurses.

^cMissing values were deleted.

^dMultiple answers allowed.

^eBy 29 years vs. Over the age of 29 years.

^fMann–Whitney *U* test.

TABLE 2 Perceptions of transitional care among the adult unit nurses and pediatric nurses who had care experience for adult patients with a child-onset chronic disease ($N = 679$)

	Adult unit nurses ^a ($n = 623$) n (%)		Pediatric unit nurses ($n = 56$)		p^b
Knowledge about the concept of transitional care ^c					<.001 ^e
Do not know	458	(73.6)	17	(30.4)	
Knows the term only	137	(22.0)	18	(32.1)	
Know a little	25	(4.0)	18	(32.1)	
Know very well	2	(0.3)	3	(5.4)	
Perceived ideal age for transition ^c					<.001 ^f
By 11–12 years	46	(7.5)	3	(5.5)	
By 14–15 years	205	(33.3)	19	(34.5)	
By 17–18 years	138	(22.4)	24	(43.6)	
By 20 years	65	(10.6)	2	(3.6)	
Over the age of 20 years	144	(23.4)	4	(7.3)	
Other	17	(2.8)	3	(5.5)	
Perceived factors for APCCD receiving pediatric health care ^d					
Patients wish to visit pediatric clinics	322	(51.7)	20	(35.7)	.020
The families of the patients hope to visit pediatric clinics	318	(51.0)	33	(58.9)	.269
Lack of coordinators to implement transitional care smoothly	246	(39.5)	29	(51.8)	.076
Pediatric doctors and nurses easily accept patients and their families	175	(28.1)	33	(58.9)	<.001
Adult unit doctors and nurses find it difficult to accept them	171	(27.4)	31	(55.4)	<.001
Perceived ideal transitional care coordinator regarding transfer from pediatrician to physician ^c					
Pediatrician	297	(53.1)	33	(64.7)	
Pediatric nurse	101	(18.1)	1	(2.0)	
Medical social worker	64	(11.4)	12	(23.5)	
Physician	32	(5.7)	4	(7.8)	
Clinical psychotherapist	29	(5.2)	0	(0)	
Others	17	(3.0)	0	(0)	
Adult unit nurse	16	(2.9)	1	(2.0)	
Department to support home medical care	3	(0.5)	0	(0)	
Perceived ideal transitional care coordinator regarding improvement in transition readiness ^c					
Pediatric nurse	213	(38.0)	9	(18.0)	
Pediatrician	148	(26.4)	16	(32.0)	
Clinical psychotherapist	77	(13.8)	7	(14.0)	
Medical social worker	58	(10.4)	11	(22.0)	
Others	30	(5.4)	1	(2.0)	
Adult unit nurse	15	(2.7)	2	(4.0)	
Physician	13	(2.3)	4	(8.0)	
Department to support home medical care	6	(1.1)	0	(0)	

Notes: Adult patients with a childhood-onset chronic disease (APCCD).

^aAdult unit nurses: nurses working in an adult unit.

^bFisher's exact test between adult unit nurses and pediatric nurses.

^cMissing values were deleted.

^dMultiple answers allowed.

^eDo not know/Know the term only vs. Know a little/Know very well.

^fBy 17–18 years vs. Over the age of 17–18 years.

[Correction added on 24 January 2020, after first online publication: Table 2 layout has been corrected.]

excluded, the data of 1,064 nurses (85.0%) were analyzed for demographic characteristics (Table 1). A further 385 nurses were subsequently excluded because they had no care experience regarding adult patients with a childhood-onset chronic disease (APCCD). Thus, the data of 679 nurses were analyzed for their perception of transitional care (Table 2).

3.1 | Participant characteristics

The majority of participants were working in adult units ($n = 959$, 90.1%) and the others were working in the pediatric unit ($n = 105$, 9.9%). Most respondents were between the ages of 20 and 29 years ($n = 541$, 50.9%) and had clinical nursing experience of up to 5 years ($n = 466$, 43.8%). The median length of clinical nursing experience was comparable between the groups (see Table 1).

The adult unit and pediatric nurses took different approaches to provide instruction for disease-associated self-management. Regarding the contents of the explanations given to patients in usual settings, the adult unit nurses provided information concerning “managing their medical information” and “available healthcare systems and services,” more often than the pediatric nurses ($p < .001$ for all items; Table 1). Pediatric nurses provided “information about admission into school and job-hunting” to patients more frequently ($p < .001$; Table 1).

3.2 | Knowledge about transitional care and the ideal transition age

Knowledge level about the concept of transitional care was lower among the adult unit nurses than the pediatric nurses (“Do not know”; $n = 458$, 73.6% vs. $n = 17$, 30.4%, respectively; $p < .001$; Table 2). The ideal age of transition for adult unit nurses was “By 14-15 years” ($n = 205$, 33.3%) whereas “By 17-18 years” ($n = 24$, 43.6%) for the pediatric nurses. Two hundred and forty-eight (21.8%) participants among both pediatric and adult unit nurses responded that the ideal transition age was “over 20 years old.”

3.3 | Perceived factors for APCCD receiving pediatric health care

The adult unit nurses tended to think that the patients' request to continue visiting pediatric healthcare resulted in transition failure ($n = 322$, 51.7%; Table 2). Pediatric nurses were more likely to point out different attitudes

of healthcare providers (easy acceptance by pediatric healthcare providers: $n = 33$, 58.9%; inadequate acceptance by healthcare professionals in adult units: $n = 31$, 55.4%) and absence of transitional care coordinators ($n = 29$, 51.8%). Half of both groups of nurses recognized the families' intention to continue visiting pediatric clinics as an inhibiting factor (adult unit nurses, $n = 318$, 51.0% vs. pediatric nurses, $n = 33$, 58.9%).

3.4 | Perceived ideal transitional care coordinator

Both adult unit and pediatric nurses replied that the CCD's “pediatrician” was the ideal coordinator to transfer patients from child-oriented to adult-oriented healthcare systems ($n = 297$, 53.1%; $n = 33$, 64.7%, respectively; Table 2). Many adult unit nurses regarded a “pediatric nurse” as the ideal coordinator regarding encouraging patients to manage their diseases ($n = 213$, 38.0%), while many pediatric nurses indicated that the “pediatrician” was the ideal coordinator for disease management ($n = 16$, 32.0%).

4 | DISCUSSION

The present research identified the primary concerns of nurses and their attitudes toward transitional care depending on their clinical backgrounds. The nurses participating in this research reported they had insufficient knowledge of transitional care irrespective of their nursing experience. Adult unit nurses particularly appeared to lack understanding of transitional care when compared with pediatric nurses. Nurses at the children's hospital in Japan recognize the importance of transitional care (Ishizaki et al., 2012). However, transitional care involving only pediatric healthcare providers may be incomplete as it fails to provide continuous support to the patients. Effective communication between adult healthcare professionals and CCD is essential to filling the service gaps between adult and pediatric clinics (Betz et al., 2013). Both adult unit and pediatric nurses should be trained to share information and knowledge on CCD in order to provide patients with a coordinated, successful transition (Bell et al., 2011; Huang et al., 2011; Suris & Akre, 2015; Watson et al., 2011). Thus, educational programs focusing on transitional care should be established and provided to all nurses who may be involved in providing transitional care to CCD.

The nurses in this study varied widely in their views of the ideal age for commencement of transition. It was “14 or 15 years old” in adult unit nurses while “17 or 18 years old” in pediatric nurses. Interestingly,

approximately 20% of nurses in each group regarded that patients with childhood-onset chronic diseases should continue to visit pediatric clinics even if they reached the age of 20. It is recommended that healthcare providers should begin to discuss ways to foster successful healthcare transitions for CCD in early childhood (Reiss & Gibson, 2002). A practical guideline recommends that the transition process should start by the early teenage years in order to assess transitional readiness (Got Transition™ Center for Health Care Transition Improvement, 2014; Warnes et al., 2008). The purpose of transitional care is not only to aid the smooth transfer into the adult healthcare system, but also to promote patients' autonomy in managing their own diseases (American Academy of Pediatrics, 2002; Rosen, Blum, Britto, Sawyer, & Siegel, 2003; Sable et al., 2011). Although some CCD need regular visits to pediatric clinics in adulthood, nurses should have an extensive awareness of early interventions and a step-by-step approach to encourage disease self-management for patients with childhood-onset chronic diseases.

The factors varied that nurses thought may underlie some APCCD who continue to visit pediatric clinics. Nearly half of the pediatric nurses suggested that poor acceptance of APCCD by adult healthcare providers as a major obstacle against transition. On the other hand, adult unit nurses were more likely to indicate the patients' wishes to remain in the pediatric healthcare system. These results may reflect the separated healthcare systems between adults and children and the insufficiency of the transitional care system in Japan (Yokoya, Ochiai, Kobayashi, Mashiko, & Mizuguchi, 2014). That is, pediatric nurses and adult unit nurses are in constant contact with different types of patients with childhood-onset chronic diseases. From pediatric nurses' perspective, CCD are high-need patients when preparing the transition to adult health care because they have encountered many CCD who are fully dependent on parents for seeking medical attention and the management of medications as well as patients who understand little about their disease, the therapeutic process, and their current medical condition. Adult unit nurses may see little of these types of CCD. Like those with adult-onset diseases, CCD who have transferred to the adult healthcare system are considered to have a built-in advantage about disease self-management and decision-making, as they were able to transfer successfully despite insufficient assistance.

In addition, pediatric nurses and adult unit nurses could have a different perception of the decision-making process. Adult unit nurses routinely care for independent and self-reliant patients. The adult healthcare system is based on patients' self-management and independent decision-making. Given this background, it may be difficult for adult unit nurses to find other possible factors for

APCCD to visit pediatric departments except for the "patient's wishes." CCD who experience the transition to adult care also seek healthcare providers who would be able to attend to their individual needs due to their difficulty with disease self-management and decision-making (Betz et al., 2013; Fegran et al., 2014). Adult healthcare professionals are not always prepared to accept APCCD because they are not familiar with pediatric-onset diseases and patients who have such diseases (Rachas et al., 2016). Having nurses develop a better understanding of the difficulties with the transition for CCD is an essential element in the building of a transitional care system.

In the present survey, pediatric nurses pointed out lack of a transitional care coordinator as one of the major factors for unsuccessful transitions. CCD were frequently concerned about the unfamiliar adult healthcare system when faced with the transfer to adult-oriented care (Tuchman, Slap, & Britto, 2008). The Society for Adolescent Medicine has stated that young people with chronic conditions and their families should have a coordinator who takes responsibility for the process of transitional care (Rosen et al., 2003). Transitional care coordinators can provide continuous follow-up by sharing and exchanging information with CCD, family members, and health professionals and facilitating communication between them (Jalkut & Allen, 2009; Rosen et al., 2003). According to the current results, most adult unit nurses expect pediatric nurses to be transitional care coordinators who encourage CCD's disease self-management. Pediatric nurses who have established a good relationship with CCD may be suitable for transitional care coordinators, acting as a bridge between CCD, families, and adult healthcare professionals.

4.1 | Study limitations

There are several limitations in this study. First, this cross-sectional survey was conducted at a single tertiary hospital in Tokyo. The hospital where this survey was conducted did not provide an education program on transitional care to nurses or have a specialty outpatient clinic for CCD, which might have influenced nurses' perceptions regarding transition to adult care. A multicenter study including children's hospitals is needed for comparing nursing perceptions with respect to continuing nursing education or cooperation with local medical institutions. Second, the CCD in this study all had no intellectual disabilities; however, attitudes toward the transitional care of CCD might be influenced by whether they have intellectual disabilities or not (Andrade et al., 2017). Future studies need to clarify nursing perception of transitional care for CCD with intellectual disabilities in order to expand the scope of

nursing intervention. Additionally, there was a considerable difference in the numbers of adult unit nurses and pediatric nurses who participated in this survey. This study is the complete census at one facility. The numbers of pediatric beds and pediatric nurses in the research facility were less than 10% of the total beds and the study population. Therefore, the recovery rates of both were almost the same. Despite these limitations, this is the first study of a large sample of nurses which examines the perceptions of transitional care for CCD among healthcare providers in Japan. These results will help in developing effective transitional care and systems in clinical settings.

5 | CONCLUSION

This research revealed that adult unit and pediatric nurses have different perceptions about transitional care for CCD. The majority of the adult unit nurses had insufficient knowledge about transitional care for CCD. The major factor identified by pediatric nurses for the unsuccessful transition was acceptance by healthcare providers and lack of transitional care coordinators, while adult unit nurses identified the major factor as CCD's wishes for continued treatment from the pediatric healthcare system. It is important to have education programs focusing on transitional care for all nurses, both to improve CCD transition readiness (through pediatric nurses) and to offer continuing support to address APCCD needs (through adult unit nurses).

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DISCLOSURE OF INTEREST

The authors have no conflicts of interest to disclose.

AUTHOR CONTRIBUTIONS

S. S., S. K., M. N., R. K., I. S., M. I., E. O., H. S., Y. H., A. S., M. S., and K. K. contributed to the conception and design of this study; M. I., E. O., and H. S. conducted the data collection; S. S. and S. K. performed the statistical analysis and drafted the manuscript; M. N., R. K., I. S., Y. H., A. S., M. S., and K. K. critically reviewed the manuscript and supervised the whole study process. All the authors read and approved the final manuscript.

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