

Abstract

An estimated 80% of intensive care unit survivors (ICU) exhibit one or more component of Post-Intensive Care Syndrome (PICS)¹. PICS is a set of mental, cognitive, and physical impairments that linger for months to years after discharge. While many ICU survivor's follow-up with their primary care provider (PCP), there is little to no research on the readiness of PCPs to care for PICS patients. This project identified gaps in awareness and knowledge among PCPs and sought ways to improve collaboration between PCPs and critical care providers. Provider age was a significant factor in awareness of PICS in PCPs.

(Keywords: PICS, Post-Intensive Care Syndrome, Screening, Primary Care Provider)

Awareness, Knowledge, and Screening of Post-Intensive Care Syndrome by Primary Care Providers

More than 5.7 million patients are admitted to ICUs annually in the United States with an estimated 4.8 million survivors.² Though survival has greatly improved, research shows that patients suffer chronic cognitive, functional, and mental health abnormalities associated with their ICU stay. These abnormalities have been identified as Post-Intensive Care Syndrome or PICS. PICS is defined as “new or worsening impairments in physical, cognitive, or mental health status arising after critical illness and persisting beyond acute care hospitalization”.³ The three separate components of PICS are psychological, cognitive, and physical impairments.

Psychological impairments include depression, anxiety, and post-traumatic stress disorder (PTSD). Rates of depression range from 28% to 37%^{2,4} while anxiety is reported 11.9%-43%,⁵ and PTSD is found in as many as 27% of patients.⁶ Cognitive impairments, defined as declines in executive function, memory, attention, visio-spatial, and mental processing speeds, occur in 30% to 80% of ICU survivors.⁷ Physical impairments include pulmonary function decline, neuromuscular changes and decreases in strength and exercise capacity.³ Physical impairment is comparable to mental health and cognitive impairments with weakness occurring in 85-95% of ICU survivors.⁸

Primary care providers are in a prime position to screen for PICS. PCPs have a relationship with the patient and see them on a regular basis after discharge. Because there is currently no evidence based way to predict which patients are at risk of developing PICS,^{8,9,10,11,12,13,14} this project assessed PCPs awareness of PICS. The purpose of this project was to describe the level of awareness, knowledge, and current screening practices of PICS by

PCPs and PCP perceptions of ways to improve collaboration between primary care and critical care with regard to PICS.

Review of the Literature

A search of PubMed, CINAHL, and Web of Science found 209 articles. Following abstract and article review, four articles met selection criteria. Three of the articles reported findings from conferences: The Surviving Intensive Care Roundtable, Brussels, 2002 and two from the Society of Critical Care Medicine 2010 and 2012 Post-Intensive Care Stakeholders' Conferences.^{3,15,16} Expert recommendations from all three conferences included the need to improve education and awareness among non-critical care providers and to enhance collaboration between PCPs and critical care providers. Needham et al. noted that due to the silo structure of critical care, this separation leads to inadequate discharge planning, deficits in PCPs awareness of PICS and readiness to care for ICU survivors, and barriers in communication that contribute to missed opportunities for process improvement and education.³

The final article assessed health policy and health-system barriers to post-ICU care. The authors found that acute care was better resourced and that many patient's follow-up with PCPs who manage busy practices. The authors recommended the design of a longitudinal care model to facilitate the transition from the ICU to the outpatient setting, improving early recognition and treatment of PICS.¹⁷

There are major gaps in research regarding the role of PCPs in the care of ICU survivors as well as the need to improve recognition, awareness, and knowledge of PICS outside the ICU.

Methods

This project was conducted in the primary care center of a tertiary, academic medical center with 22 primary care clinics. A convenience sample of PCPs employed in the primary care

center was identified from the primary care website. Inclusion criteria included: physicians (medical doctors (MD) and doctors of osteopathy (DO), nurse practitioners (NP), and physician's assistants (PA) within the primary care center. Physician board specialties included family medicine, internal medicine, primary care, and geriatrics. Family, adult, acute-care, and general nurse practitioners were included, as well as PAs with any specialty. Exclusion criteria were residents, non-licensed providers including registered nurses, licensed practical nurses, nursing assistance, and administrative staff. Other board certifications in pediatrics, mental-health and obstetrics/gynecology, were excluded. The final sample included 104 providers: 74 MDs, 23 NPs, three DOs, and four Pas. Of these, 64 were female, 40 were male, and the mean length of practice of 14.9 years (Table 1).

A survey to assess levels of awareness, knowledge, and current screening practices for PICs and areas for improved collaboration was created by the lead investigator and disseminated anonymously via a secure surveying system after obtaining face validity. Demographics collected were age, gender, board certification and years in practice using a secure surveying system to maintain anonymity.

Results

Twenty-eight (26.9%) providers responded to the survey: 17 MDs (60.7%), 10 NPs (35.7%), and one DO, with 22 (78.6%) being female. No PAs responded to the survey. The respondents were representative of the sample except for significantly more males responding ($p=0.030$). Respondent demographics are listed in Table 2.

Of the 28 people who responded, 20 (71.4%) reported being not at all familiar with PICS, 8 (28.6%) reported being somewhat familiar, and no respondents reported being very familiar. Respondents 40 years or younger were significantly more likely to report being somewhat

familiar than those over the age of 40 years ($p=0.044$) and specifically MDs 40 years or younger were significantly more likely to be somewhat familiar than those MDs over the age of 40 years ($p=0.004$).

Thirteen (46.4%) providers reported that they are not notified if a patient has survived an ICU admission and four (14.3%) were unsure if they are notified. Ten of the 11 (39.3%) providers that reported being notified, reported notification via electronic medical record (EMR), letter, and patient disclosure.

The eight providers that reported being somewhat aware of PICS consisted of seven MDs and one NP, five were female, and six were between the ages of 31-40 years. Two of those providers reported screening for PICS using the Patient Health Questionnaire-2 and the Mini Mental Status Exam. Six providers reported caring for at least one patient who had recently survived an ICU admission, with two of those providers reporting consideration of PICS for this patient.

The level of knowledge among the eight providers that were familiar with PICS was relatively high. The average score was 82.5% with three respondents scoring 100%, four scoring 80%, and one with a score of 40%.

Participants were asked to rank order a list of strategies (Figure 1) to improve collaboration between PCPs and critical care providers. The response “mandatory follow-up appointment” was ranked in the top three preferences by all respondents. Two respondents placed “MyChart notification”, designated PICS clinic, and “other” as their top choice. Further breakdown of responses can be found in Figure 1.

Discussion

Generalizability was limited by the small sample size. However, the data showed areas for improvement to ensure early diagnosis and appropriate management of PICS in ICU survivors at this facility. As early as 2002, experts identified a need for increased awareness of PICS outside of the ICU, improved communication between critical care and outside providers, and a need for improved education of providers in non-critical care areas.¹⁵ (Angus and Carltet). Needham et al., stated that those deficits, along with the tendency of critical care providers to operate in silos, have led to inadequate discharge planning, barriers in communication, and missed opportunities in caring for ICU survivors.³ (Needham, Davidson and Cohen). This project identified similar missed opportunities in the processes used to care for ICU survivors. With a fairly representative sample, 71% of providers were not at all familiar with PICS, indicating an opportunity to improve awareness and knowledge among PCPs regarding PICS.

Another area for improvement is in collaboration and communication among PCPs and critical care providers. Less than half of those surveyed reported being notified if their patient is an ICU survivor and only a quarter of respondents reported screening for PICS regularly. The most frequent responses by PCPs regarding improved collaboration were the use of mandatory follow-up appointments and the use of the EMR.

Given the small sample size from a single tertiary medical center, more research is needed to define the role of the PCP in caring for ICU survivors. The survey needs to be further developed and assessed for reliability and validity. The survey also restricted responses related to collaboration by limiting responses to only those who were familiar with PICS. In retrospect, it could have been useful to collect data from all respondents regarding collaboration as it is an identified barrier to transitions in care and adequate care of ICU survivors and PICS patients. A response of only eight limits conclusions or descriptions of awareness and knowledge of PICS by

PCPs. A strength of the project was that survey completion was anonymous. Using an electronic survey system for distribution made for easier data collection and interpretation.

Conclusion

This project identified a need for improved screening, recognition, and treatment of PICS in the primary care setting. This is specifically important for advanced practice providers (APP) in primary care. As full practice authority is realized, the care of ICU survivors will be an expected area of expertise. Increased education will help to better recognize and treat these patients. Improving awareness and knowledge of PCPs regarding PICS is one way to identify and treat patients early. Improved collaboration between primary care and critical care is necessary to ensure PICS patients receive appropriate follow-up care.

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Table 1.
Demographic Characteristics of Sample

Demographic	Provider Pool N=104 n (%)
Gender	
Female	64 (61.5)
Male	40 (38.5)
Licensure Type	
Medical Doctor (MD)	74 (71.2)
Nurse Practitioner (NP)	23 (22.1)
Doctor of Osteopathy (DO)	3 (2.9)
Physicians' Assistant (PA)	4 (3.8)
Specialty	
MD	n=74
Internal Medicine	41 (55.4)
Family Medicine	27 (36.5)
Primary Care	6 (8.1)
NP	n=23
Family	21 (91.4)
Acute Care	1 (4.3)
Adult	1 (4.3)
DO	n=3
Primary Care	1 (33.3)
Family Medicine	1 (33.3)
Internal Medicine	1 (33.3)
Years in Practice (Mean = 14.9)	
0-5	32 (30.8)
6-10	11 (10.6)
11-15	17 (16.3)
16-20	12 (11.5)
>20	32 (30.8)

Table 2.
Demographic Characteristics of Respondents and Non-respondents

Demographic	Respondents n=28	Non-Respondents n=76	<i>p</i>
	n (%)	n (%)	
Age			
<=30	1 (3.6)	N/A (Data unavailable)	
31-40	11 (40.3)		
41-50	7 (25.0)		
51-60	7 (25.0)		
>60	2 (7.1)		
Gender			.030 ^{†*}
Female	22 (78.6)	42 (55.3)	
Male	6 (21.4)	34 (44.7)	
Licensure Type			0.122 ^{††}
Medical Doctor (MD)	17 (60.7)	57 (75.0)	
Nurse Practitioner (NP)	10 (35.7)	13 (17.1)	
Doctor of Osteopathy (DO)	1 (3.6)	2 (2.6)	
Physicians' Assistant (PA)	0 (0.0)	4 (5.3)	
Specialty			
MD	n=17	n=57	.063 ^{††}
Internal Medicine	7 (41.2)	34 (59.6)	
Family Medicine	10 (58.8)	17 (29.8)	
Primary Care	0 (0.0)	6 (10.5)	
NP	n=10	n=23	n/a
Family	9 (90.0)	21 (91.4)	
Acute Care	§	1 (4.3)	
Adult		1 (4.3)	
DO	n=1	n=3	n/a
Primary Care	§	1 (33.3)	
Family Medicine		1 (33.3)	
Internal Medicine		1 (33.3)	
Years-In-Practice			.353 ^{††}
0-5	8 (28.6)	24 (31.6)	
6-10	5 (17.9)	6 (7.9)	
11-15	4 (14.2)	13 (17.1)	
16-20	5 (17.9)	7 (9.2)	
>20	6 (21.4)	26 (34.2)	

[†] Chi-square test comparing respondents and non-respondents

^{††} Exact Chi-square test comparing respondents and non-respondents

* *p*<.050

§ Specialty area withheld to maintain anonymity

Figure 1.

Provider Perceptions of How to Improve Collaboration Between PCPs and Critical Care

