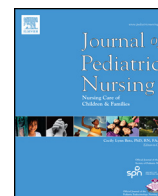




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## The Influence of Context on Utilizing Research Evidence for Pain Management in Jordanian Pediatric Intensive Care Units (PICU)

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### ABSTRACT

**Purpose:** The purpose of this study was to gain a beginning understanding of the contextual factors that influence the use of research for pain management in Jordanian Pediatric Intensive Care Units (PICUs).

**Design and Methods:** A paper or online questionnaire was used to collect data on instrumental research use (IRU) and conceptual research use (CRU) and ten contextual variables from 73 registered nurses working in four Jordanian PICUs. The Pearson product-moment correlation coefficient was used to test the relationship between continuous (demographic and contextual) factors and IRU and CRU. One way ANOVA and independent *t*-test were used to examine the differences between sociodemographic variables and IRU and CRU. Generalized Estimating Equations (GEE) was used to determine the demographic and contextual factors that influenced research use. We modeled the significant variables identified by bivariate correlation, *t*-test, and ANOVA at ( $p \leq 0.10$ ).

**Results:** Nine of the contextual factors significantly and positively correlated with the IRU for pain assessment, eight with the IRU for pain treatment, and six with the CRU for pain management (including assessment and treatment). Hospital type (public) predicted the IRU for pain assessment. Social capital, structural, and electronic resources predicted the IRU for pain treatment. Social capital predicted the CRU for pain management.

**Conclusion:** Context influences Jordanian PICU nurses' use of research for pain management.

**Practice Implications:** Concentrating on modifiable contextual factors may positively influence Jordanian PICU nurses' use of research for pain management. This influence may extend to reduce children's pain in Jordanian PICUs.

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### Introduction

Children have the right to access appropriate pain management provided by adequately-trained health care providers (International Association for Study of Pain [IASP], 2015). However, pain management in the Pediatric Intensive Care Unit (PICU) has been reported to be sub-optimal (Agarwal et al., 2010; Grant et al., 2012). In a study of adverse events in PICUs in the United States of America, uncontrolled pain was one of the most common major adverse events reported, with 82% of these pain events considered to be preventable (Agarwal et al., 2010).

Pain management in children in the PICU may be more challenging than in other populations. Many factors can challenge health care providers to effectively assess and treat children's pain in the PICU such as children's physical and cognitive development, the nature of the child's

critical condition, and the complexity and severity of illness in the critical care setting. In addition, the self-report of pain in the PICU (widely considered the gold standard for pain assessment and treatment) is complicated by the administration of sedative agents, paralytic agents, mechanical ventilation, and, often, altered and changing levels of consciousness (Gelinis et al., 2004; Ismail, 2016; Oakes, 2011; Srouji et al., 2010; Turner, 2005).

The use of research evidence is a critical factor in providing appropriate pain management (Samuels and Fetzer, 2009). However, there is a gap between knowledge and practice (Hanberg and Brown, 2006; Samuels and Fetzer, 2009). To design successful interventions aimed at improving the use of research evidence for pain management, there should be a clear understanding about the nature of the research evidence being used, the quality of the context, and the type of facilitation needed to ensure a successful change process (Rycroft-Malone et al., 2002). Context (the environment in which a health care providers work) is widely considered a significant factor that can influence the successful implementation of research evidence in healthcare settings (Dopson et al., 2002; Estabrooks et al., 2003; Fleuren et al., 2004;

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Greenhalgh et al., 2004; Meijers et al., 2006; Rycroft-Malone, 2004; Wallin et al., 2006). However, little is understood about the organizational factors (embedded in context) that may influence health care providers' use of research to guide the practice (Stevens et al., 2011). What is known is primarily from a Western context, where human and financial resources are less challenging than in developing countries such as Jordan (Finley et al., 2008). Based on ownership and governance, hospitals in Jordan can be categorized into five types: Ministry of Health (public funded by the government), Royal Medical Services (military hospitals), private (private funded and work for profit), non-profit non-governmental (self-operated and mainly funded by money donated by people), and university hospitals. Jordan Ministry of Health supervises health services offered by all sectors (Jordan Ministry of Health, 2013a). These five types have different organizational contexts affecting the way of delivering patient's care. In Canada for example, the health care system is publicly funded. Without paying out-of-pocket, all residents have access to hospital services. The standards for health care are set and administered by the federal government (Government of Canada, 2016). Therefore, organizational contexts of the hospitals can be less different.

### Review of Literature

Several studies that have been conducted in Western countries demonstrated the importance of context for research utilization. In Canada, Cummings et al. (2007) found that registered nurses working in a positive environment with supportive leadership, constructive work culture, and effective evaluation process reported significantly more research utilization in clinical practice (IRU) than nurses working in less positive environments. In addition, they found that responsive administration (administration that listens and responds to staff concerns e.g., providing resources), relational capital (social capital), and hospital size (number of beds) positively, but indirectly, influenced nurses' research utilization by acting through staff development, opportunities for nurse-to-nurse collaboration, and staffing and support services. In a subsequent study, Cummings et al. (2010) found that pediatric nurses who reported more positive perceptions of their context, including culture, leadership, and evaluation, reported higher instrumental research use (IRU) and higher conceptual research use (CRU). Instrumental research use (IRU) is the direct application of research findings, and the conceptual research use (CRU) is being aware of research findings that could alter the way of thinking and/or practicing (Cummings et al., 2010).

From responses of 2361 nurses working across different care settings in Canada and Australia, Squires et al. (2015) found that contextual factors such as leadership, culture, evaluation, formal interactions, informal interactions, structural and electronic resources, social capital, organizational slack-time, organizational slack-staffing, and organizational slack-space correlated positively with both IRU and CRU. Organizational slack is described as the unit cushion of resources (actual or potential) that helps the unit to adapt to internal and external pressures e.g., staffing and space (Estabrooks et al., 2009). In a study conducted in Canadian pediatric hospitals which included medical, surgical and critical care units, Squires et al. (2013) found that organizational culture and the proportion of nurses having a baccalaureate degree or higher were predictors of IRU and leadership, culture, evaluation, formal interactions, informal interactions, and organizational slack-space were predictors of CRU. These studies focused on the general research use for any condition. This study only focused on the research use for pain management in Jordanian PICUs.

Several studies have been conducted investigating pain management in Jordanian hospitals (Abdalahim et al., 2011; Abdel Razeq et al., 2016; Al Qadire and Al Khalaleh, 2014; Ayasrah et al., 2014; Batiha, 2014; Finley et al., 2008; Forgeron et al., 2006). Yet, no studies have evaluated the influence of context on research utilization for pain management in Jordanian PICUs.

### Purpose

The purpose of this study was to gain a beginning understanding of the contextual factors that influence research utilization by nurses to guide pain management in Jordanian PICUs. The specific aims were to:

- 1) Examine the relationship between each of the contextual factors and each kind of research utilization for pain management.
- 2) Identify the significant predictors for research use.

### Methods

The Promoting Action on Research Implementation in Health Services (PARiHS) model guided the planning and conduct of this study (Kitson et al., 1998). The PARiHS model consists of three main constructs: (1) evidence, (2) context, and (3) facilitation. These three elements are interrelated, and each is positioned on a "high" to "low" continuum (Kitson et al., 1998; Rycroft-Malone et al., 2002). Successful implementation of research evidence is purported to be a result of interplay between the three constructs. In order to successfully translate the pain management evidence into practice, there is a need to clearly understand the context where the evidence to be implemented, the type and nature of the evidence, and the type of facilitation to be provided (Kitson et al., 1998; Rycroft-Malone, 2004; Rycroft-Malone et al., 2002). Contextual factors can play an important role in facilitating or inhibiting the research use (Rycroft-Malone, 2004). Pain management research use in Jordanian PICUs is no exception. The focus in this study was on assessing the contextual factors of the PICU setting in Jordan. Another focus was examining the relationship between these factors and research use for pain management.

### Design

A cross-sectional survey design was used to capture Jordanian PICU nurses' perceptions about aspects of the context in which they work and the extent to which they use research evidence for pain management.

### Sample

Registered nurses working in PICUs in Jordan, including charge nurses and staff nurses, were invited to participate in this study. The inclusion criteria were (1) working in the PICU in Jordan for six months or more, so they had adequate experience to answer the survey items, and (2) able to read, write, and understand English. Exclusion criteria were (1) nurse managers, (2) head nurses, and (3) practical nurses. The expected sample size was small. The expected population of PICU nurses in Jordan was 120 nurses (H. Gharaibeh, personal communication, April 4, 2013). The sample size was calculated based on bivariate correlation. Using GPower 3 software, the number of participants to establish a significant association between each contextual factor and each kind of research use for pain management using Pearson's correlation was approximately 67 PICU nurses (Faul et al., 2009). There were no similar studies conducted in a Jordanian context to calculate the effect size from, so a moderate effect size (0.30) was used. The number of participants required for 80% power at the 5% alpha level, and a moderate effect size (0.30) between the two variables is 67.

Nurses were invited to complete a paper-based or web-based questionnaire based on their preference. Having both options available for survey completion might enhance the response rate. The online questionnaire was hosted on FluidSurveys, which is a Canadian company that has security measures in place in order to keep the data confidential such as: 1) secured server for the data; 2) data encryption using Secured Socket Layer (SSL); and 3) de-identified responses (FluidSurveys, 2015). The recruitment procedure was initiated two months before the commencement of data collection. The principal investigator (PI) visited the research sites and met with the nurse leaders and with the PICU

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