The Effect of Oral Glucose and Non-nutritive Sucking in Reducing Needle-Related Procedural Pain among Infants

Thesis

Submitted for Partial Fulfillment of the

Requirements for the Doctorate Degree

in Pediatric Nursing

By

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List of Abbreviations

APA …….	Association of Paediatric Anaesthetists
CHEOPS……..	Children's Hospital of Eastern Ontario Pain Scale
CNS……..	Central Nervous System
(FLACC) Behavioral Pain Scale **……**	Face, Legs, Activity, Cry, and Consolability Behavioral Pain Scale
IASP……..	International Association for the Study of Pain
NNS……	Non-Nutritive Sucking
OPS……..	Objective Pain Scale
PCA……..	Post Conceptual Age
WHO……..	World Health Organization

ABSTRACT

Infants experience pain similarly and more intensely than older children and adult. The issue of pain management in infants has been largely neglected in most clinical settings, despite subjecting them to painful procedures. However, non-pharmacological interventions are reported to be effective in relieving pain in infants **(Rouben, 2013)**. **This study aimed** to evaluate the effect of oral glucose and non-nutritive sucking in reducing needle-related procedural pain among infants; Assess nurses' knowledge and practices toward oral glucose and non-nutritive sucking as a non-pharmacological pain relief strategies in alleviating pain among infants undergoing acute painful procedures; and plan, implement and evaluate the effect of the nursing guideline program on nurses' knowledge and practices. **Research design:** A quasi-experimental research design was applied to achieve the aims of the study. **Settings:** The study was carried out at the Paediatric Emergency Department and Outpatient Clinics at Ain Shams Children's Hospital and the Immunization Center for Children affiliated to Ministry of Health in Benha City. **Subjects:** A purposive sample of 120 infants was selected by specific criteria and randomly distributed into one control and three experimental groups and 23 nurses who were available during the study period and working on the study settings. **Tools of data collection:** 1) Structured interview questionnaire sheet for nurses to assess their knowledge, 2) Observation checklist for nurses' practice regarding to oral glucose and non-nutritive sucking in reducing needle-related procedural pain among infants, 3) Infant assessment sheet, 4) FLACC behavioral pain scale to assess infant's pain, and 5) Crying time. **The results of this study** revealed that there were very highly statistically significant differences of total FLACC behavioral score between the experimental groups and the control group after the intervention, as well as, mean of crying time. Also, the study result revealed that the majority (91.3%) of the studied nurses improved in their knowledge immediately after the program implementation and at follow-up. In addition, all nurses had competent in their practices immediately after implementation of the program compared to 87% at follow-up. **The study concluded** that, the use of oral glucose and non-nutritive sucking is effective in reducing pain for infants undergoing needle related procedures. Moreover, the implementation of the nursing guideline program had a positive effect on the improvement of nurses' knowledge and practices regarding oral glucose and non-nutritive sucking as non-pharmacological pain relief strategies in alleviating pain among infants undergoing acute painful procedures. **The study recommended** that, oral glucose and non-nutritive sucking should be used in pediatric units as a routine intervention to reduce pain during minor needle related procedures for infants. Also, the educational programs and trainings for pediatric nurses should be focused particularly on training them about pediatric pain and its non-pharmacological management.

Key words: Oral glucose, Non-nutritive sucking, Procedural pain, Infants

Introduction

Pain is a highly individualized, subjective experience that can affect any person at any age. It is a complex phenomenon that involves multiple components and is influenced by several factors; while, it involves both sensory and emotional factors **(International Association for the Study of Pain "IASP", 2012)**. In children, pain is a highly prevalent problem; it is a predominantly subjective emotional distress that also leads to impairment in their quality of life **(Inal & Kelleci, 2012; Canbulat et al., 2014).** The most common and important sources of pain experiences by infants are medical pain; primarily needle pain such as venipunctures and immunizations, while its cause fear. This fear of pain experienced due to medical procedures in the infancy period usually continues up to adulthood. Indeed, Infants experience pain similarly and probably more intensely than older children and adults **(Michael & Ric, 2009)**.

The experience of untreated pain early in life can lead to physiological and psychological consequences for children. Such as increase oxygen consumption and increased distress during later procedures. While, treating pain decreases the need for physical restraints, and prevents short and long term consequences of pain **(Kyle & Carman, 2013)**. Part of the reluctance to aggressively treat pain during infancy was rooted in the belief that the pain system was not yet fully developed. Also, due to the nonverbal nature of infants, they are incapable of reporting and describing the subjective phenomenon of pain **(Bissonnette et al., 2011)**.

Reduction of pain is both a professional imperative and an ethical expectation. Pain reduction therapies are often under used for the numerous minor procedures that are part of routine medical and nursing care for infants. Scientific and clinical evidence points to the efficacy of natural, non-

pharmacological strategies to reduce pain due to minor procedures **(Academy of Breastfeeding Medicine Protocol Committee, 2010)**. Some of these strategies are feeding of sweet compounds such as sucrose, glucose, and saccharine; non-nutritive sucking on pacifiers **(Michael & Ric, 2009)**.

Over the past century sweet tasting solutions have been used to promote calm and to reduce pain in infants and even before this time Prophet Mohammed, circa 632 AD, recommended giving infants a well chewed date **(Harrison et al., 2011)**. Sucrose and glucose are the most commonly used sweet-tasting solutions; however, they are effective, simple and fast-acting non-pharmacological method to use and have no documented side effects. There is no fully accepted explanation for the pain-reducing effect of sweet-tasting solutions, but activation of endogenous opioids has been suggested as a possible mechanism **(Suhrabi et al., 2014)**.

Additionally, offering a pacifier is the most common way to provide non-nutritive sucking to an infant **(Liu et al., 2010)**. Non-nutritive sucking is a comfort measure for infants and helps them to calm. Oral administration of 30% glucose combined with sucking provided better control of pain induced by blood sampling in newborns at neonatal unit **(Mekkaoui et al., 2012).** These interventions may modulate pain sensation and response to pain through changes in attention and decreasing apprehension **(McGrath et al., 2014)**.

Nursing is the profession with the greatest pediatric patient contact. One of the important nursing cares includes the alleviation of pain. Infants are less able to communicate their pain to staff nurses. So, the important responsibility of health care professionals who care for infants is eliminating pain and its suffering when possible. However, insufficient knowledge among nurses and inadequate application of knowledge contribute to the lack of effective management. The personal values and beliefs of health care