
Effect of Yakson Touch on Physiological Indicators of Preterm Infants during Painful Procedures; A Randomized Controlled Clinical Trail

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Abstract

Preterm infants are sensitive and experience pain through invasive procedures in the Neonatal Intensive Care Unit more than term infants. One of the painful and frequent procedures is cannulation. **Aim:** this study was to determine the effect of Yakson touch and pacifier on pain and physiological response in preterm infants during cannulation. **Methods:** a clinical trial of 60 preterm infants was conducted in a NICU affiliated with El-Arbain Hospital, Assiut governorate, Upper Egypt. Sixty preterm infants matched the inclusion criteria were included in this study divided chronologically into two groups (Yakson and control groups). Thirty infants were in each group. Neonatal Infant Pain Scale (NIPS) was used to evaluate pain responses. Pain and physiological indicators (pulse, respiration, and oxygen saturation) were measured before and after cannulation. Comparison was done among the control and study groups to define the effect. **Results:** The mean gestational age of the included infants was 33.17 and 33.93 weeks in both the Yakson and control groups respectively, and the weight mean was 1.49 kg with no statistical differences among both groups. While days of life have differed which infants in the control group had high days of life mean. Respiration and pulse rates decreased after the procedure in the Yakson group, while they increased in control. Also, the pain means scores increased after the painful procedure in the control group while decreased in Yakson (control after = 6.03, Yakson after = 3.90). **Conclusion:** Yakson's touch message successfully decreased pain levels, pulse, and respiration rates among preterm infants exposed to painful procedures. Moreover, performing Yakson improves oxygen saturation levels among preterm infants in the study group. **Recommendations:** try to incorporate Yakson touch into routine care to maintain preterm infants' stability.

Keywords: Preterm Infants; Yakson Touch; Pain: Invasive Procedures.

Introduction

It is a frequent misconception among healthcare professionals that preterm infants do not sense or experience pain. However, evidence suggests that these infants not only experience pain but also react more strongly to it than infants who are delivered at term (Hill et al., 2005). That could be because preterm infants are unable to suppress the coming signal of pain because of the imbalance activity of neurotransmitters (Im et al., 2008). Recently, researchers contend that trauma inflicted during the neonatal period may have long-lasting deleterious impacts, such as altered responses to pain and heightened physiological responses to stress, in later life (Fatollahzade et al., 2022). However, they confront many painful and invasive procedures several times a day during their stay at Neonatal Intensive Care Units (NICU) (Cruz et al., 2016 and Bucea& Pillai, 2019). The average of painful procedures that preterm experience a day is about 7.5–17.3 according to a systemic review study (Britto et al., 2014 and Hatfield et al., 2018). The most common painful procedure in NICUs is cannulation. It is associated with pain and stress in neonates (Pölkki et al., 2016). Therefore, preterm infants need adequate interventions for better pain management during invasive procedures.

Non-pharmacologic techniques for pain management offer the maximum benefit with less risk. Non-pharmacologic techniques used during regular unpleasant invasive procedures have recently gained importance in the management of pain throughout the newborn period as a result of advances in our understanding of the

physiology of pain (Stadler et al., 2018 and Suzanne et al., 2010). Non-pharmacologic techniques are simple, non-invasive treatments that don't call for specialized tools or technology. Moreover, it can reduce stress and shorten disease duration, expense, and consequences (Yiğit et al., 2018). The most common methods of non-pharmacologic pain control techniques are non-nutritive sucking, pacifier, skin-to-skin contact, infant positioning, touch, and massage (Eshghi F, 2012).

Yakson touch is one of the non-pharmacologic techniques with means 'healing hand' (Parashar et al., 2016). Using one hand to softly massage the baby's stomach and the other to place on their back, this ancient Korean therapeutic touching method helps calm and ease discomfort in newborns and infants (Im & Kim, 2009 and Deghani et al., 2019). They believe that preterm infants absorb warmth and energy through the provider's palm which was believed to reduce the infant's tension (Corbo et al., 2000). It is reported that Yakson touch help infants unwind, foster pleasant behaviors, and lower behavioral stress while also consuming less energy and engaging in less motor activity (Corbo et al., 2000). On the other side also used as a non-pharmacological method to control pain among infants (Pinelli et al., 2002 and Huang et al., 2004) and maintain physiological stability through reduced crying duration and heart rates (Gormally et al., 2001 and Dur et al., 2020). Studies on non-pharmacological management of frequent painful procedures such as cannulation are limited in Egypt. So, this study aimed to determine the effect of

Yakson on pain and physiological indicators of preterm infants during painful procedures.

Operational definition:

Painful procedures include all invasive procedure that could be done to premature infants such as cannulation and blood sampling.

Aim of the study: was to determine the effect of Yakson touch and pacifier on pain and physiological response in preterm infants during painful procedures.

Research hypotheses:

Preterm infants who receive Yakson's touch will practice less pain during any painful procedure in comparison to the control group.

Preterm infants who receive Yakson's touch will maintain stable vital signs (pulse rate, respiration rate, oxygen saturation) than control group.

Subject & Methods

A randomized clinical trial study included 60 preterm infants. The infants were selected from the NICU of El-Arbain Hospital, Assiut governorate, Egypt.

Sample and subjects:

The required sample size that would achieve 90% power to detect a two-tailed significance level of 0.05 is 51 infants (Corbo et al., 2000). Thus, this number was optimized to 60 considering dropout cases. All preterm infants in the selected NICU included except those who are weighing less than 1000 grams, unstable infants, those on mechanical ventilators, and those receiving sedatives. Included preterm infants were divided into two groups (Yakson and control group) based on their admission data.

Measurements: Two tools were used to collect the necessary data for this study:

Preterm infant's data tool; it's developed by the researchers based on the relevant literature. It entailed two parts; a) sociodemographic data; includes information such preterm infants' gestational age, weight, and chronological age. b) physiological indicators; include pulse, respiration, and oxygen saturation pre and post intended intervention.

2) Neonatal Infant Pain Scale (NIPS); to assess preterm infants' pain during painful procedures. It was developed by (Lawrence et al., 1991) to evaluate pain levels of preterm infants, this scale is valid and reliable and used in several studies (Bellieni et al., 2006 and Suraseranivongse et al., 2006). English form of the scale was used without translation. NIPS assess six indicators; facial expression, cry, breathing patterns, arms, legs, and state of arousal, each item ranges from 0-1 except cry 0-2, which total score would be between 0-7.

Intervention:

Yakson touch is a Korean tradition and was recently studied academically and revealed that Yakson is predicated on the idea of life force emanating from mothers' hands (Corbo et al., 2000 and Sarhangi et al., 2011 and Williams et al., 2009). A simple protocol of Yakson has been used in this study, this protocol is a modified version of traditional Yakson developed by Hyesang Im in 2009 and examined by the head of the Korean Yakson Society to make sure it complied with the necessary conditions to be referred to as a Yakson protocol (Corbo et al., 2000). The modification has been done to be appropriate for preterm infants. It is a 12 minutes intervention as the following (figure 2).

Procedure:

Official agreement was obtained from the manager of NICU at El-Arbain Hospital. In addition, oral consent for participation was taken from each parent of the included infants' after they received a full explanation of the study's aim and clear their right to refuse participation or withdraw from the study at any time without any harm or penal condition. The preterm infants were randomly allocated in birth order to one of two groups (Yakson or control) after obtaining the consent of their parents. Admission order was employed for random assignment since recruiting 60 preterm infants at once was not feasible. For instance, the Yakson group was assigned to the first participating newborn admitted to the NICU, while assigned to the second participating infant admitted to the NICU. The Yakson group received Yakson touch 12 minutes before the painful procedure and continued through the process, while controls received routine unit care (Figure 1). A certified research nurse put on a sterile inner gown, cleaned her hands for two minutes using antimicrobial agents, and then used a radiant warmer to warm both of her hands. Vital signs and pain levels be assessed before and after the painful procedure for both groups.

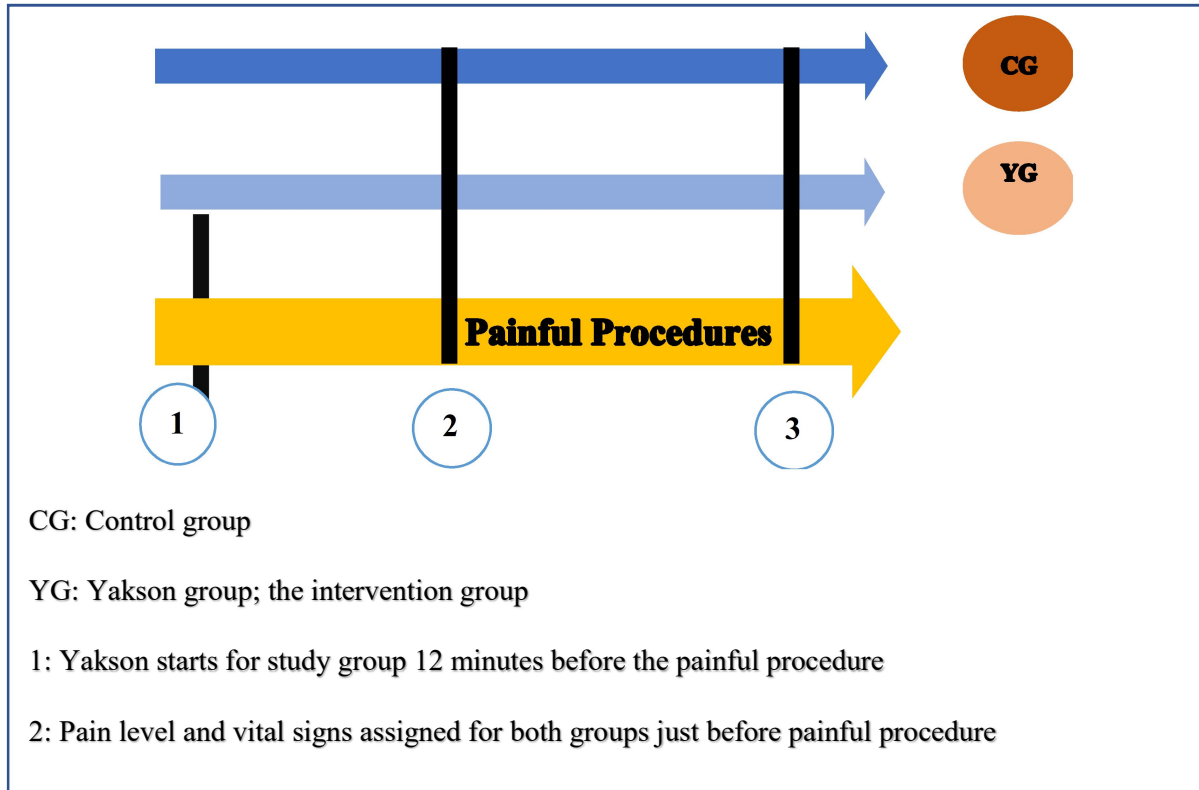


Figure 1: the study group timeline

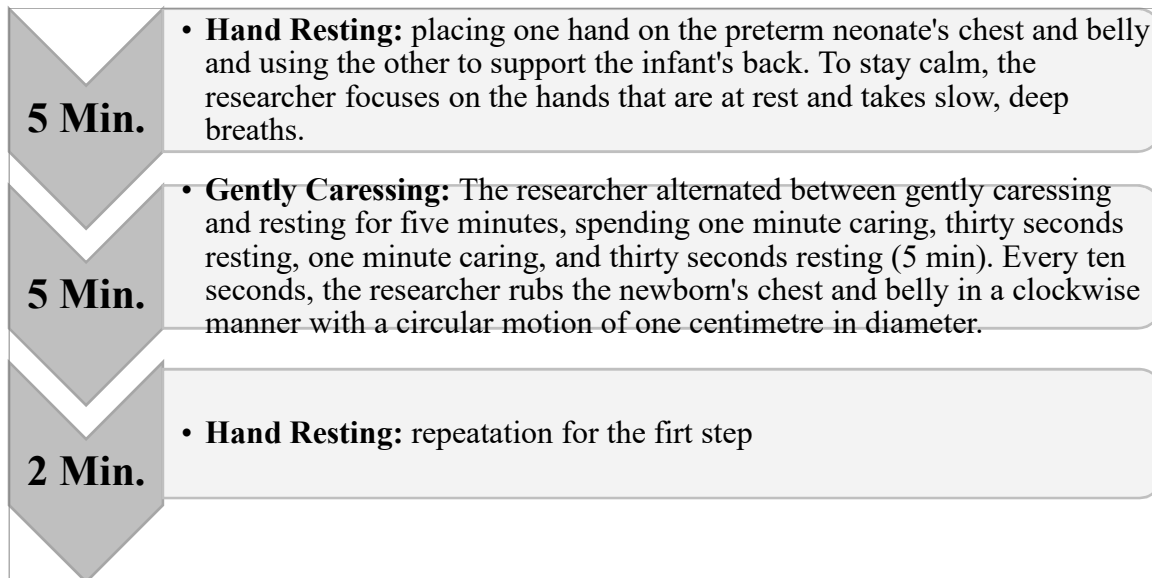


Figure 2: Steps of Yakson Intervention

Ethical considerations: The ethical committee at the Faculty of Nursing Assiut University approved this study by date 28 August 2023.

Statistical analysis:

For the statistical analysis, Windows SPSS version 22 was utilized. The statistical software tool SPSS was used to analyze the data. Frequency and percent descriptive statistics were employed to describe the research subjects. The normality was investigated to determine if the measured values of the study variables fit the normal distribution hypothesis. To compare baseline characteristics of the subject such as gestation age and chronological age independent sample t-test was used. For testing the hypothesis, a paired sample t-test was used to compare pain levels and vital signs before and after a painful procedure among both groups.

Results

Figure (3) reveals that the majority of premature infants are male in the control group but the majority of them are female in the Yakson group. Approximately 67% of the individuals had a caesarean section (C/S) during birth.

Table 1 shows that with a mean gestational age of infants is 33.17 and 33.93 weeks in both the Yakson and control groups respectively. There are statistically significant differences regarding days of life between both groups where the premature infants aged in the Yakson group are younger than those in the control group at the P-value ($P=0.009$). The mean infants' weight is (1.97) and (1.70) in the control and Yakson group respectively.

Table 2 Portrays the infants' vital signs and total pain mean scores in the Yakson and control groups. Yakson's therapeutic touch had a significant impact on the vital signs (oxygen saturation, respiration, and pulse) of premature infants. This table shows that following the intervention, preterm infants in the study group have lower mean scores for breathing and pulse. Conversely, following standard care, preterm infants in the control group have higher mean scores for respiration and pulse. Throughout the trial, there are statistically significant differences ($P=0.000$) between the two groups both before and after the intervention. After the intervention, the Yakson group's preterm babies' total oxygen saturation means scores increased. Conversely, preterm babies in the control group had lower oxygen saturation levels. There are statistically significant differences between Yakson and control groups after intervention only at ($P=0.000$) & ($P=0.019$) respectively.

Table 3 shows total pain score between infants in control and Yakson group. Mean of pain score before any painful procedure are relatively equal in both group (control=5.27, Yakson=5.79), while after the procedure pain score decreased in Yakson group to be 3.90 versus 6.03 in control. P-value for paired sample t-test with significance level ≤ 0.05 , SD= Standard Deviation

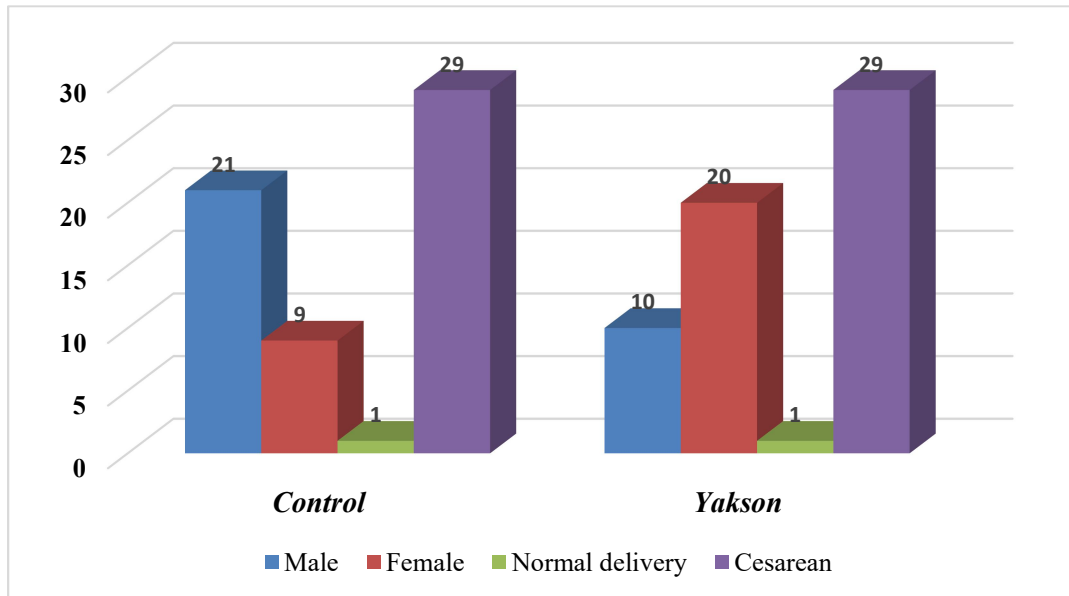


Figure 3: Gender and delivery methods distribution among the study groups

Variables		Control Mean(SD)	t(P)	Yakson Mean(SD)	t(P)
Respiration	Pre	52.90(11.95)	-2.904(0.007)	55.10(11.14)	7.323(0.000)
	Post	55.07(11.90)		51.00(11.42)	
Pulse	Pre	147.57(18.14)	-5.805(0.000)	157.00(19.82)	9.748(0.000)
	Post	150.70(16.82)		149(18.75)	
Oxygen saturation	Pre	95.93(3.61)	2.475(0.019)	95.17(3.05)	-5.401(0.000)
	Post	95.43(3.42)		96.40(2.51)	

P-value for paired sample t-test with significance level ≤ 0.05 , SD= Standard Deviation

Table 3: Total Pain Score Before and After Painful Procedures Among Study Groups			
Variables		Mean(SD)	t(P)
Control group	Pre	5.27(1.87)	-3.357(0.002)
	Post	6.03(1.24)	
Yakson group	Pre	5.79(1.20)	8.680(0.000)
	Post	3.90(1.14)	

P-value for paired sample t-test with significance level ≤ 0.05 , SD= Standard Deviation

Discussion

The aim of this study was comparison the effect of Yakson and routine procedural touch on vital signs and pain levels among preterm infants. Research indicates that Yakson touch is more beneficial in promoting the physiological stability and behavioral condition of preterm newborns. The impact of Yakson's healing touch on preterm newborns has not been extensively studied (**Hanson et al., 2010**). Studying how Yakson's message affected the vital signs and degree of suffering in preterm newborns was crucial.

Regarding sociodemographic data, the study and control group were on the same baseline for gestational age and weight, while differed in days of life. Gestational age was quite equal in both infant groups. For weight, the infants in the control group have a high weight mean in comparison to Yakson but without statistically significant differences. However, days of life were high in the control group (mean more than 6 days), while they were low in the Yakson group (mean 4 days) with a

statistically significant difference. Preterm infants are exposed to numerous invasive interventions and unlimited stimuli in the NICU (**Baba et al., 2010 and Obeidat et al., 2009**). Therefore, routine manipulations such as this one involving touch may have a deleterious impact on an infant's behavioral state. This study considered procedural pain during a common practice in the NICU where the infant feels pain. According to the results, the Yakson group compared with the control group indicated less pain score after interventions compared to that before the intervention. By increasing preterm coping mechanisms, therapeutic touch approaches can minimize pain and tension while also activating control systems to avoid nociceptive transmission during repeated unpleasant procedures like heel lancing and aspiration throughout the infant period (**Pillai et al., 2011**). According to our research, the heart rates and respiration of the groups were comparable before painful procedure, and the preterm infants in the Yakson

group had lower heart rates and respiration following painful procedure than the control group. These results indicate that the therapeutic touch techniques are useful in lowering heart rate and respiration scores after procedures. Similar to our findings, **Mir et al. (2018)** discovered that while there was no significant difference between the groups' pre- and post-procedure heart rates and respiration rates, the control group's pulse and respiration were found to be higher than those of the other groups following painful procedure. Nonetheless, following the implementation of the intervention, the preterm newborns in the Yakson group had greater mean oxygen saturation during the course of the trial. On the other hand, following normal care, oxygen saturation dropped in the control group, with a statistically significant difference between the study and control groups following the intervention. This may be explained by an increase in catecholamine production following epidermal massage. Additionally, beta-adrenergic receptors in the airways are affected by adrenaline, which causes them to dilate and enhance alveolar ventilation (**Herrington et al., 2014**). The mean oxygen saturation eventually improves as a result of this process. This conclusion is consistent with **Parhi, Das & Sahoo's, 2021**) findings, which showed that there were statistically significant variations in the post-test oxygen saturation between the control and experimental groups (**Fatollahzade et al., 2022**). On the other side, there are other studies

revealed no changes occur among Yakson\ message group and control (**Dur et al. 2020 and Parhi et al., 2021**). -

Conclusionz According to the results, it was found that Yakson message successfully decreased pain levels, pulse, and respiration rates among preterm infants exposed to painful procedures. Moreover, performing Yakson improves oxygen saturation level among the study group.

Recommendations

-All NICU nurses should get training on Yakson's therapeutic touch technique and how to incorporate it into the treatment of premature infants in the NICU.

A simplified pamphlet or audio recording about Yakson's therapeutic touch and how to apply it has to be provided to nurses who work in intensive care units.

- Larger sample sizes and longitudinal designs are needed for future studies in order to account for the post-NICU phase and investigate Yakson's impact on subsequent developmental outcomes. Since preterm infants will eventually return home to be cared for mostly by their parents, it would be beneficial to investigate the impact of Yakson done by their parents. Yakson's impact on the bond between preterm newborns and their parents might also be investigated in this subsequent study.

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