Elmhurst University

Health Sciences Fair 2020

Welcome to the Health Sciences Fair 2020 at Elmhurst University

Dean Pribbenow, Dean of the Faculty

Health Sciences Fair

5th year

Opportunity for Elmhurst University students studying in Health Sciences fields to present their research and clinical projects

Treatment approaches, evaluations of methods to improve health, close studies of the manifestation of disease/disorder

Clinical work presentation and evaluations

Innovative ideas to study disease/disorder

Health Sciences Fair Committee Members

- Jeanne Burda, Nursing Department
- Lauren Brenon, Nursing Department
- Ruth Schumacher, Nursing Department
- Brenda Gorman, Communications Speech Disorders Department
- Kathy Sexton-Radek, PhD., Psychology Department

Student Presentations from Nursing, Psychology, Communications Speech Disorders, Occupational Therapy Departments

- *Psychology Department:*
- *Valerie Thomas, Ankelika McFeely, James Hutto "How Meditation Can Reduce Stress"*
- *Olivia T., Olivia B., Briana Clanci, Madelon Moser "Health Promotion of Overall Wellness of Body and Mind during Quarantine"*
- *Hollyanne George, "Consciousness Awareness in Whales-Implications for Increasing our Awareness"*
- *Grace Gregory, "Exercise Makes Quarantine Fun"*
- *Sarah Cimino, "Benefits of routine rehabilitation and exercise for post-surgical senior and geriatric patients"*

- *Communications Speech Disorders Department:*
- *Savannah Meinen, Impact of Ankyloglossia on Speech and Feeding*
- *Megan Paolucci, "Dysphagia in Parkinson's Disease"*
- *Emily Baxa, "We Are Missing the Consequences of Chemotherapy-Induced Hearing Loss in Pediatric Brain Tumor Survivors"*

Student Presentations from Nursing Department

- Nicole Kim SN, Department of Nursing The Impact of PPE Education on Anxiety Levels Regarding COVID-19 Restrictions
- Justine Balousek and Itzel Munoz, The Impact of Maternity Leave on Postpartum Mood and Anxiety Disorders
- Iana Mamulat SN, Amanda Noor Ali SN, An Integrative Research Review of Late Umbilical Clamping Compared to Traditional Early Umbilical Clamping during Delivery
- Danielle Montella & Cynthia Rodriguez-Huspen, An Integrative Research Review on Intraoperative Skin-to-Skin with Cesarean Section and its impact on Neonatal Adaptation
- David Garcia & Andrew Hawkins, Neonatal Hyperbilirubinemia and Massages

Nicole Kim SN, Department of Nursing

- The Impact of PPE Education on Anxiety Levels Regarding COVID-19 Restrictions
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- Mentor: Professor Laura Brennan MS, RN, Department of Nursing
- Sponsor: Dr. Ruth Schumacher DNP, RN, CNL, CPN, Department of Nursing
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- Abstract
- Many people are uneducated on how to properly put on Personal Protective Equipment (PPE) (Kaiser Family Foundation, 2018, p. 1). This poses the question: In college students, does education on the proper use of PPE reduce anxiety levels compared to no PPE education during quarantine? College students will be educated using a video on PPE usage. Students will complete a knowledge quiz and questionnaire to assess their anxiety levels and be compared to a group of students that did not watch the video. Data from both groups will be compared on knowledge and anxiety levels. It is expected that by providing education on COVID-19 restrictions and proper PPE usage, students will be better equipped, more prepared for future pandemics, and feel less stress and anxiety.
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- Key Words: COVID-19, coronavirus, anxiety, personal protective equipment, face masks, education, prevention, pandemic, nursing, college students

Impacts of Ankyloglossia on Speech and Feeding

Savannah Meinen
Faculty Mentor: Cheri S. Carrico Ph.D. CCC-SLP
Department of Communication Sciences and Disorders

- Ankyloglossia, or tongue tie, is a condition that restricts tongue mobility as a result of the presence of a short, tight lingual frenulum.
- Regarding speech, those with tongue ties may experience articulation difficulties. With limited tongue mobility and elevation, it is harder for affected individuals to reach their tongue to various points of articulation. Ankyloglossia does not cause speech delays, rather, it is associated with articulation problems that clinicians may need to discuss with clients and their families (Messner & Lalakea, 2002). Furthermore, there are negative effects with feeding, especially breastfeeding. Specifically, increased oral transit time, decreased bolus mobility, choking, gagging, expelling food, frustration with eating, diet selectivity, pocketing food, and tongue thrusting may be present (Potock, 2015).
- Opinions vary regarding what types of classifications are suitable when assessing ankyloglossia. There is no concrete rating scale, aside from mild, moderate, severe, and profound, leading to discrepancies in severity diagnosis. Despite the negative effects of having a tongue-tie, there are treatments options, including observation, speech therapy, otolaryngotherapy, frenotomy, frenectomy, Z-plasty, and laser frenectomy (Kale et al., 2019).

Dysphagia in Parkinson's Disease

Megan Paolucci, B.S.
Elmhurst University
Communication Sciences and Disorders: Speech-Language Pathology

- Purpose: This study was designed to analyze how the incidence of dysphagia among hospitalized Parkinson's disease patients affect the differing demographics, clinical characteristics, length of hospital stay, hospital charges, incidence of gastrostomy tube, and prevalence of aspiration pneumonia. It is hypothesized that the incidence of dysphagia among hospitalized Parkinson's disease patients will increase the risk of pneumonia and gastrostomy tube as well as increase the patients length of hospital stay and hospital charges.
- Method: All the research was completed by the Division of Patient Safety and Quality of Illinois Department of Public Health. They hold the data regarding the number of deaths resulting from Parkinson's disease in all of Illinois from 2011 to 2015 differing by a variety of demographics such as race, gender, ethnicity, and age range. All patient data from Illinois acute care hospitals, specialty hospitals, and ambulatory surgical treatment centers were collected for this study. The patient data includes demographic information and clinical characteristics, primary diagnosis and secondary diagnoses, the incidence of gastrostomy tube, the incidence of pneumonia, their length of stay, and their total hospitalization charges. This study includes all in-patients in Illinois who had a primary diagnosis of Parkinson's disease during the time frame of September 2012 to September 2015.
- Results: Dysphagia in Parkinson's disease patients is incredibly prevalent. The incidence of dysphagia was 12.7% among the hospitalized Parkinson's disease patients. Dysphagia in Parkinson's disease presents more prevalent among Caucasian patients, older patients, and male patients. There is a higher incidence of gastrostomy tube than aspiration pneumonia, however the incidence of Parkinson's disease patients with these co-morbidities were similar. The presence of dysphagia in Parkinson's disease patients increases the length of hospital stay and the total amount of hospital charges. The length of stay and total hospital charges also increase with the presence of a gastrostomy tube or pneumonia.
- Conclusion: This study suggests that dysphagia in Parkinson's disease patients is very prevalent (12.7%). The analyses of the data show that Parkinson's disease patients with dysphagia are more likely to be diagnosed with pneumonia and gastrostomy tubes. With these co-morbidities, the length of hospital stay and total hospitalization charges increase greatly. Due to the minimal participant population and no cause-and-effect relationship, further research is necessary to explain the results of the above clinical findings.
- Key Words: Parkinson's disease, dysphagia, aspiration pneumonia, gastrostomy tube

Grace Gregory & Hannah B. Project Exercise Makes Quarantine Fun-The exciting and entertaining way to survive social distancing

- During the first crisis since 9/11 and for some young people, their first crisis ever, things are becoming less chaotic. The only topic of discussion on social media is COVID 19 and people are struggling to mentally and physically manage social distancing. In a world where everyone is expected to live busy lives, slowing down is unbearable. This health promotion project will demonstrate how exercise can prevent mental illness and maintain physical wellbeing while living in isolation during the COVID-19 pandemic

Sarah Cimino &
Mirna Olague
,Department of
Psychology

- “Benefits Of Routine Rehabilitation And Exercise for Post-Surgical Senior And Geriatric Patients and Address Ways In Which Not To Abuse Rehabilitation Tactic”
- Rehabilitation adherence post-surgery is very important especially for senior and geriatric patients. Throughout our research, we identify how rehabilitation adherence can decrease the risk of infection, disease, acute pain, psychological disorders, prolonged hospitalization and healing. We identify throughout our research the differences between patients that were independent and dependent before surgery and how their lifestyle had changed or stayed the same after surgery that had determined the outcome of the patients healing and rehabilitation adherence. Likewise, our research also identified the difficulties patients face with having underlying health conditions that prolonged and made their recovery difficult without proper adherence and clinical support. Lastly, we were able to identify key aspects of rehabilitation tactics and regimes that overall improved patient healing and satisfaction to allow them to continue their daily routines with little to no physical differences after their rehabilitation therapies.

Valerie Thomas, James Hutto & Ankelika McFeely How Meditation Can Reduce Stress

- This project tested college students' levels of stress and its relation to responses to meditation. A pretest postest intervention (no control group) method was used. Initial and followup levels of stress were determined after a meditation intervention script was read (one session). A statistically significant difference between pre and post stress measures was found. Results will be discussed.

Olivia Tomal, Olivia B., Brianna, Maddy Health Promotion of overall wellness of body and mind during quarantine

- This project was guided by the Health Beliefs Model which states that health-related behavior depends on the combination perceived susceptibility, perceived severity, perceived benefits perceived barriers, cues to action and self-efficacy. An app was proposed for development that would provide the phone owner with more self-awareness, positivity and time for exercise. It was proposed that the regular use of this app would provide the user with increased perception of benefits, cues to action and self-efficacy and lower awareness of susceptibility and severity of stressful experiences. Further details of how the app will work and how the data collected may be used are discussed.

Orca Whales and Consciousness

Name: Hollyanne George

- Abstract: The purpose of this paper is to provide an understanding of animal consciousness and consciousness awareness shown in orca whales. Broad speculation surrounds the world of animal consciousness and questions regarding if animals are aware of their own cognitive thought processes and self-awareness. Strong evidence and studies show that orca whales have highly sophisticated brains similar to great apes and humans further emphasizing that orcas may possess self-awareness of one's self within their environment and the importance and impact of social organization connections made over the lifespan of the orca.

The Impact of Maternity Leave on Postpartum Mood and Anxiety Disorders

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Abstract

In the past, it was unknown whether maternity leave and postpartum mood and anxiety disorders were linked. After reviewing national surveys and research studies, a direct relationship has been found. The length of maternity leave has been found to impact the mental health of a postpartum mother.

Statement of Problem

In primiparous or multiparous women around the world, does maternity leave impact the likelihood of postpartum mood and anxiety disorders?

Methods

Inclusion Criteria:

- Any race or ethnicity
- Studies that were completed between 2014 and 2020
- Studies that included maternity leave as an intervention
- Studies that measured any postpartum mood and anxiety disorders

Exclusion Criteria:

- Studies that only used men as their participants
- Studies that were published in a language other than English
- Studies that measured mood and anxiety disorders outside of the postpartum time

Search Process:

- Search engines: PubMed, CINAHL Complete, and MEDLINE with Full Text
- Keywords: maternity leave, postpartum mood & anxiety disorders, postpartum depression

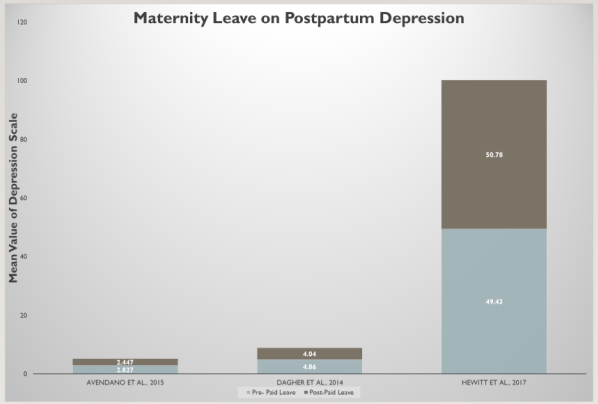
-Two cross-sectional studies, a cohort study, and two difference-in-difference studies were used

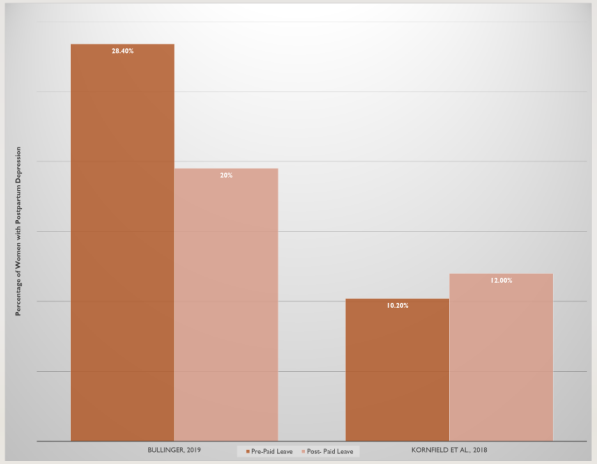
-Two authors reviewed eight articles. Two articles were excluded for not looking at maternity leave and one was excluded for not measuring postpartum mood and anxiety disorders. Five articles met the criteria and were used for data collection.

-3 articles used depression scales (Edinburgh Depression Scale, EURO Depression Scale, and Short Form 12)

-2 articles used surveys/questionnaires (Patient Health Questionnaire and a comparison of self-reported surveys)

Results





Conclusion

Based on the evidence from the research studies, there is a prominent link between maternity leave and the risk of women having postpartum mood and anxiety disorders. As for the length of maternity leave, the average length of maternity leave among the research studies were six weeks and did show a decrease in the risk for women developing postpartum mood and anxiety disorders (PPMAD). In particular, one of the articles showed maternity leave up to twelve months long and this length of paid leave showed the greatest overall decrease in developing PPMAD. However, the likelihood of women being able to have a twelve month long maternity leave is unrealistic. Therefore, an average of six weekslong maternity leave is beneficial enough for women to take to help prevent PPMAD. In addition, a woman having unpaid maternity leave instead paid leave does not significantly decrease the possibility of developing PPMAD.

Future Research

More research should be done on this topic that includes the following changes:

- Research that includes different socioeconomic classes and not just the middle class or above
- The impact of maternity leave on PPMAD if the infant requires special care
- Research if different cultural practices during maternity leave have an effect on developing PPMAD.

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An Integrative Research Review of Late Umbilical Clamping Compared to Traditional Early Umbilical Clamping during Delivery

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Abstract

- The American Heart Association and the American Academy of Pediatrics recommended DCC for at least 30 to 60 seconds during the transition of vigorous preterm neonates to extrauterine life American Heart Association (As cited in Alivey & Gallo, 2018)
- Some articles define early cord clamping (ECC) as one that is done within 30 seconds of birth in Qian et al., research study, while delayed cord clamping (DCC) is defined as a range from 30- 60 seconds (Kresch, 2017), 45-90 seconds (Nudelman et al., 2020) and/or more than 30 seconds (Qian et al., 2019), etc.
- Late cord clamping is considered when umbilical arterial pulsations cease (Kresch, 2017).
- Another interesting method mentioned regarding umbilical cords is milking of the cord that can potentially improve and/or lead to same or close results with the delayed cord clamping(Kresch, 2017).
- DCC implementation results in higher Apgar score as compare to ECC (Alivey & Gallo, 2018)

Statement of the Problem

In neonates and mothers, what are the effects of the delayed umbilical clamping compared with traditional early umbilical clamping during labor and delivery?

Methods

Inclusion Criteria:

- Studies that addressed early, delayed and late umbilical cord clamping as well milking the umbilical cord.
- Studies that compared the results and effects of early and delayed umbilical cord clamping in mothers and preterm or term neonates.
- Experimental Research Design Studies that were conducted in the period of 2015-2020; including one systematic review, narrative literature review, RCT, or primary sources of original research.
- One narrative overview that synthesizes the findings from searches of computerized databases.
- Any race or gender.
- Some subjects gave informed consent to participate, while some studies did not require informed consent to be obtained (Qian et al., 2017).
- Assessment of alive preterm and/or term neonates.
- Studies with at least one author that is a nurse and/or doctor.
- Studies from the United States or comparable level of care.

Exclusion Criteria:

- Studies that were published as abstract only.
- Studies that were published before 2015.
- Studies published abroad and did not have a comparable level of care equal to USA.

Search Process:

- Sources: CINAHL, PubMed, Medline with full text.
- Keywords used independently and grouped during literature research: neonates, baby, infant, newborn, immediate, early and/or delayed cord clamping, late, time factors, maternal or prenatal outcomes, labor, delivery, timing, umbilical cord, etc.
- Systematic review of quantitative studies (one systematic review, one randomized control trial, two tool validation studies using observational methods, pilot-randomized control trail, one retrospective pre/post descriptive study).
- 5 articles were reviewed by 2 authors; one was excluded based on publication date and/or limited or lack of information on effects of umbilical cord clamping related to maternal or prenatal outcomes.

STUDY (Authors	DESIGN (Framework)	SAMPLE	VARIABLES/ MEASURES	RESULTS	SUMMARY
Kresch	Design: Quantitative, Review study that includes systematic reviews, meta-analysis of DCC, quality improvement audit studies, one retrospective cohort study, one RCT. Framework: Provides with an explanation of DCC and transitional physiology of the neonate. Umbilical cord milking in premature infants (24-28 weeks' gestation) results of RCT.	Didn't include a specific sample because it is a review study.	Variables: • Gestational age of the infant (preterm vs term), no preference in genders, short and long-term outcomes of the neonates.	Key findings: • There were a list of benefits of DCC for preterm, term infants including maternal outcomes. • Umbilical cord milking was considered faster than the DCC. • DCC in the review was defined as 3 minutes or after umbilical cord pulsation cessation, showed increased iron storage and hemoglobin at 4 months of age check-up. • Slightly increase in the risk of jaundice and the need of phototherapy <2 %. • Also in infants with DCC showed lower incidence of the IVH(intraventricular hemorrhage) and lower rates of the late-onset sepsis compared with the infants with ECC.	• Overall study quality rating: V (Fair) Article provides good information but is not formatted for easy understanding. It goes back and forth between several studies providing only some relevant results. Significance for Nursing Care and Research: • This study provides a summary of relevant information regarding DCC from different studies and lists benefits from DCC for all preterm, term infants and maternal outcomes.
Nudelman et al., 2020	Design: • Quantitative, System atic review which includes 2 RCT studies and 3 observational studies. Framework: • This study compares and analyzes the blood gas values of the term newborns with ECC vs DCC.	• Described the difference in means of cord blood gas from 23 different studies. • N=234 newborns with ECC • N=218 new borns with DCC	Variables: • DCC, ECC and mean umbilical arterial pH and venous umbilical deficit. • Another variable in these studies was different timing of DCC and ECC. Measures: • Outcome measures that were assessed were PCO2, PO2, HCO3,pH lactate and base deficit. • Studies were classified by two reviewers as include, exclude or unsure. • Discrepancies were discussed by an adjudicator (D.S.)	Key findings: • The reviewers screened 148 records and 23 eligible studies were used • Interviewers agreement was 97% • (k =0.89, [95% CI 0.81-0.91], P<.001) for the initial record screening and then 100 % during the eligibility assessment. • Risk of bias was low for each study • Quality of evidence moderate because of the different terms and time ranges for the ECC (0 seconds, less than 10 seconds, and less than 30 seconds) and DCC (45-180 seconds). • DCC of the serial arterial umbilical samples was associated with decrease in pH(0.02-0.03) and HCO3(0.3-0.8 mmol/L, mean increase in base deficit of 0.3-1.3 mmol/L) and lactate of (0.2-0.6 mmol/L) when compared with the ECC of less than 30 seconds. • No studies have shows difference for the venous PO2 between DCC and ECC.	• Overall study quality rating: I (Good) Study provides straightforward and concise information on umbilical blood gases of the term newborns with ECC and DCC. Significance for Nursing Care and Research: • This article contributes to the growing body of evidence that DCC can decrease a significant number of newborn complications and hospital costs along the way if the DCC is used.
Qian et al., 2019	Design: • Qualitative study done as a synthesis and narrative overview of literature from the searches of computerized databases which incorporates RCT Framework: • Compares the ECC with DCC on maternal and neonatal outcomes.	No clear sampling numbers are indicated in this research review of the literature.	Variables: • DCC, ECC, • preterm, term neonatal and maternal benefits and/or outcomes Measures of the DCC: Hemoglobin levels (HB) and iron storage; neurobehavior, BP; need of transfusion; immune and infectious diseases, incidence of the intraventricular hemorrhage (IVH); incidence of the necrotizing enterocolitis and chronic lung disease; hypothermia; breathing and Apgar scores; jaundice and phototherapy in infants; maternal postpartum hemorrhage;umbilical acid-base status; cord blood units and stem cells .	Key findings: • DCC has beneficial effects on almost both categories of the infants (preterm and term) such as: • an increase of hemoglobin, iron storages, • an improve in neurobehavior, with higher scores in motor development and alertness behavior, • A decrease in need of transfusions • lower risk of IVH, necrotizing enterocolitis and chronic lung disease • Reduces the vulnerability to infectious diseases • Strengthens the immune system • Reduces the risk for hypothermia • And no risk for maternal outcomes such as need for transfusion, blood loss at delivery, HB levels, etc.	• Overall study quality rating: V (Fair). This study is an easy read and is based on the summary of other researches which provide enough evidence about ECC vs DCC and the benefits related to the later one. Significance for Nursing Care and Research: • This study can be used to empower nurses to learn more about ECC and DCC as well as to what aspects to pay attention to and how to educate the parents about DCC. • Key finding this study unique is that it talks about the effects of DCC on the stem cells the number of which increases with each second that s delayed.
Alivey & Gallo, 2018	Design: Evidence based practice project with pre and postintervention design and a collaborative, interprofessional team approach. Frameworks: Rogers's diffusion of innovation model. It consist of five steps that are knowledge, persuasion, choice, implementation, and confirmation. It is widely used to lead a change in current practice. Donabedian's model consists of 3 separate but interrelated concepts of structure, process, and outcome.	• 50 preterm neonates met the criteria during the implementation phase. • The obstetric team implemented DCC for 31 neonate and ECC for 19 neonates.	Variables: • Rate of each cord clamping practice • Apgar scores (1 and 5 minutes) • Characteristics of the obstetric team Measures: Analyze the data using two independent sample t test Assessed the experience, knowledge, and professional perspectives regarding DCC of the obstetric team with the self-report DCC Survey131 professionals fill out the survey. The survey was completed 1 week before implementation and was repeated at the completion of the project at 9 weeks.	• Apgar scores at 1 minute DCC M = 8.35, SD = 0.551, n = 31 ECC M = 7.16, SD = 1.834, n = 19 t (20.008) = 1.197, p = .012 • Apgar scores at 5 minute DCC M = 9.00, SD = 0.258, n = 31 ECC M = 8.58, SD = 838, n = 19 t (20.116) = 2.130, p = 0.046 • Apgar scores at 1 and 5 minutes were statistically significantly higher with DCC implementation. • Team members agreed that DCC is a clinically appropriate change in practice at the hospital increased from 31% to 58%	• Overall study quality rating: V (Fair). This study is easy to understand but it lacks RCT. It is mostly focused on implementation of DCC. Although the study showed the benefits of DCC in compare to ECC. Significance for Nursing Care and Research: • This research shows that RN can play a key role in in leading changes in current health care systems. • The nurses should advocate for clinical based evidence practice at patient's bedside. • The nurses should lead evidence based practice projects and be part of initiating and facilitating new practices.
Buckes et al., 2015	Design • Quantitative study • pilot randomized control trials Framework: Entry criteria, maternal and fetal exclusions criteria were used. • ECC < 10 S • DCC 110-130 s	• N= 30	Variables: • Deliveries were assigned into ECC and DCC groups • Bilirubin levels • Hematocrit • Blood transfusions frequency Measures: • Hematocrit levels at 72 hours • Group comparison for continuous variables were made using t test. • Kaplan Meier curves are used to evaluate the probability of doing blood transfusions	• Higher peak in bilirubin levels noted in the DCC group (9.2±2.2 vs 7.3±3.2 mg.dl−1, P=0.08) • Hematocrit levels were higher in the DCC group infants as compare to ECC groups during first 72 hours of life. • The proportion of infants not receiving blood transfusions throughout hospitalization was higher in the DCC than in the ECC infants (43 vs 7%, log-rank test P=0.02). • DCC appears safe and feasible for the infants with congenital heart diseases. • DCC results in an increase to the neonate of 20–40 ml of blood per kilogram of body weight.	Overall study quality rating: V (Fair). This study has very limited sample. Moreover, it was hard to randomized neonates in DDC and ECC groups. This study was a pilot study. Significance for Nursing Care and Research: • This study also emphasize the need of more clinical trials that focus on specific type of heart diseases and need for blood transfusions and impact of DCC.

Discussion

Strengths:

- Studied from many different angles
- Evidence for DCC of 45 sec in preterm and term infants indicated lower rates of hypothermia and lower numbers of admissions to NICU than ECC.
- The Kresch study provided multiple outcomes and benefits of DCC in preterm and term infants.
- Lower risk of adverse outcomes may lead to decreased hospital stays and lower cost of care.
- DCC improves Apgar scores which are linked to long-term benefits, such as decreased incidence of intraventricular hemorrhage, necrotizing enterocolitis, and blood transfusions in preterm neonates (Alivey & Gallo, 2018)
- Increase in the number of neonates who do not require transfusions from 7 to 43% due to DCC (Backes et al., 2015)
- It does not increase maternal postpartum hemorrhage and maternal transfusion. Although it decrease maternal hemoglobin in mothers (Kresch, 2017)

Limitations:

- It's difficult to come to conclusions which timing of the DCC is appropriate when there are many variables to each study and when the DCC is defined differently in each case.
- Generalizability is limited as not all studies were conducted in the U.S. and nursing care differs.
- Many different variables are used to show effectiveness of DCC.
- DCC has positive and negative outcomes which can limit clinical practice. DCC has shown to increase the risk of neonatal jaundice, polycythemia, and blood viscosity (Backes et al., 2015)
- One of the articles mentions the importance of designing some equipment and/or strategies to improve the resuscitation of the infants while being very close to the mother and while the umbilical cord is still intact and attached to the placenta (Kresch, 2017).
- Delayed umbilical cord clamping (DCC) results in an increase to the neonate of 20–40 ml of blood per kilogram of body weight

Nursing Implications:

- DCC could lead to decreased length of hospital stays and reduced complications. As a result, it will save hospitals money which allows for reallocation of funds to greater areas of need.
- **Nursing actions and education** – receive training on hospital regarding this procedure and proper teaching of the patients and their families.
- **Ethical issues:**
- Regardless of the patient diagnosis, the providers and the nurses must make sure they know and respect the patient's previous wishes and advanced directives.
- It is hard to do RCT studies for neonates as all healthcare facilities have different protocols with regards to DCC.

Barrier to Implementation:

- Patient might still refuse DCC despite the benefits listed here.
- No universal timing on how long should DCC be done.
- Requires additional training for nurses which might require time and money.

Conclusion

Level of evidence for entire body of research:

- Enough evidence was provided by these articles to support that delayed cord clamping improves the outcomes of the preterm and term infants by preventing future developmental complications.
- Delayed cord clamping is simple, effective, safe procedure that requires no cost, so it can be done easily anywhere anytime!
- Quality rating of these studies ranged from levels I-III which supports the increased interest in delayed cord clamping as well as importance of these studies' results in promoting a new possible evidence-based practice.

Nursing recommendations for FUTURE RESEARCH:

- Further studies should re-evaluate the milking of the cord with DCC instead of ECC as it was used as a control group in the meta-analysis from Kresch review to compare the effectiveness of this method and compare the results with DCC only to see if there is an increase in benefits for infants and the mother.
- A better universal ideal length of time of DCC and ECC should be established that can be applied and used nationwide if desired by parents.
- One of the articles mentions the importance and the need of designing some equipment and/or strategies to improve the resuscitation of some infants while being very close to the mother and while the umbilical cord is still intact and attached to the placenta, so the neonate could still benefit from the DCC especially when she/he is going through some critical or emergency situations of any sort (Kresch, 2017).

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An Integrative Research Review on Intraoperative Skin-to-Skin with Cesarean Section and Its Impact on Neonatal Adaptation

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Abstract

Skin-to-skin contact (STS) between mother and newborn has become the gold standard of care following delivery. The CDC defines skin-to-skin (STS) care as, "placing the infant directly on the mother or other caregiver in an effort to maximizes surface-to-surface contact." Benefits can include, breastfeeding initiation, stress reduction and thermoregulation (Centers for Disease Control and Prevention, 2020). Because of this, STS is recommended by the CDC immediately following delivery when mothers and newborns are medically stable. Past research has centered on the implementation and importance of STS following vaginal delivery or in the recovery room following cesarean section. Many providers have questioned the risks of intraoperative STS for the neonate and mother in terms of temperature stability, breastfeeding, maintenance of sterility and infection prevention. Current research explores intraoperative STS for mothers experiencing a cesarean section. This integrative research review, centered on exploring the benefits of intraoperative STS on neonatal outcomes. Neonatal outcomes included breastfeeding, temperature regulation, and admission to the neonatal ward. Findings concluded that women who had intraoperative STS were more likely to initiate and maintain breastfeeding compared to those who did not experience STS intraoperatively (Wagner, 2018). In addition, research indicated that newborns who had intraoperative STS maintained or increased temperature. Intraoperative STS was found to have no risk on infant thermoregulation (Billner-Garcia, 2018). Finally, conventional cesarean sections without intraoperative STS were found to have approximately double the admissions to neonatal wards compared to admission for those who experience intraoperative STS (Billner-Garcia, 2018).

Research Question

In mothers who had a cesarean section what is the effect of intraoperative skin-to-skin on neonatal adaptations compared with no intraoperative skin-to-skin?

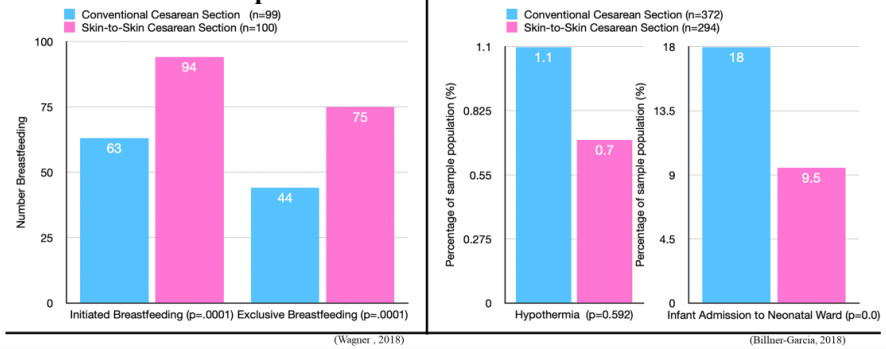
Neonatal adaptations include temperature regulation, breastfeeding outcomes, and newborn admission to neonatal ward.

Methods

Inclusion Criteria:

- Studies that addressed intraoperative skin-to-skin in cesarean sections.

Results of Intraoperative Skin-to-Skin on Neonatal Outcomes



Study (Authors)	Design (Framework)	Sample	Variables/Measures	Results	Summary
Billner-Garcia, 2018	Design: • Quantitative, descriptive, retrospective Framework: •Deidentified data was created from the electronic medical record (EMR) of all eligible mothers and their infants. • Infant's axillary temperatures were recorded before and after intraoperative skin-to-skin (STS). • Intraoperative STS was initiated after the 5 min APGAR score and concluded post closure of the cesarean section or if the mother asks to conclude sooner. • The APGAR determined neonatal stability in order to participate in intraoperative STS	• n= 91 • Mean Maternal age = 35 (SD=4.2) • Infant gestational age (IGA) Mean = 39.4 weeks • IGA Range = 38-41 weeks and 5 days • Participants needed to be full-term singleton infants of women 18 years and older. Birth had to be elective cesarean section ≥ 38 weeks to ≤ 42 weeks' gestation • Infants with known or suspected complications (ex. Congenital defects requiring intensive care, resuscitation efforts at birth, and 5 min APGAR scores of ≤ 7) were excluded from the study	• Infant APGAR scores at 5 min • Mean APGAR 5 min= 9 • Range APGAR 5 min=9-9 • Skin-to-skin (STS) contact in minutes Mean= 13.6 (SD=5.4) • Infant Temperature change T1-T2 °C. Temperature was taken axillary using digital thermometers to minimize risk of rectal perforation. • Infant weight in grams. Range= 2,720-4670 g, Mean= 3,566 g (SD=401.83)	Key findings r/t Neonatal Outcomes: • Infants were deemed eligible for the study based on 5 min APGAR scores. All infants that had a score of ≤ 7 were excluded. All infants included in this study had a 5 min APGAR score of 9. All of the infants included were stable. • Total STS times were extracted from the EMR • Infant Temperature – Temperature from T1 and T2 remained the same in 21% of the sample. T2 increased in 35% of the infants. Temperature decreased in 44% of infants and only 10% had an axillary temperature less than 36°C. Over half of the sample size either increased in temperature or stayed the same in the result of STS intraoperatively.	• Overall study quality rating: III (Fair) This study supports the continuation of intraoperative STS by demonstrating that infant temperature was maintained or increased for most participants. But this study does not provide data describing the statistical significance of these findings. • This study may push other hospitals to make changes to traditional practice and offer STS in the OR. Significance for Nursing Care and Research: • Facilitating or offering Intraoperative STS for mothers is a great intervention for nurses to implement. • Neonatal hypothermia is a major concern for newborns. Originally there have been concerns of neonatal hypothermia during intraoperative STS. The findings of this study demonstrate that most infant temperatures rose or remained the same with intraoperative STS. • All healthcare providers should be educated about STS. • Should be knowledgeable of facility policy regarding neonatal hypothermia and the procedures related. • Clinical leaders should develop STS guidelines to promote higher rates of intraoperative STS. • STS occurrences can be increased by educating mothers on maternal and neonatal benefits of Intraoperative STS, throughout the pregnancy and at birth.
Gregson, 2016	Design: • Randomized control study to examine the effects of immediate STS within the operating room on breastfeeding rates at 48 hours Framework: • Participants were randomly assigned to one of two groups: intraoperative STS or delayed STS once operation was complete. • Intraoperative STS group – at birth in the intraoperative room, the newborn was placed STS in prone position on mother's chest, mother was encouraged to keep baby STS as much as possible. • Control group – received STS after operation completion • Breastfeeding rates were then measured via patient hospital records and questionnaires completed.	• n= 369 • Random assignment of participating women into one of two groups – immediate intraoperative STS (n = 182) (mean age 34.0 years) or delayed skin-to-skin once operation was complete (n = 187) (mean age 33.2 years) • All participants had an elective cesarean at ≥ 37 weeks' gestation and were a singleton pregnancy • All participants were chosen based on choice to breastfeed at birth	• Breastfeeding rates at 48 hours (primary measure) • Additional measures • feeding methods at 10 days and 6 weeks after birth • admission to neonatal unit • length of time initial STS after birth was performed in first 24 hours • women's experiences	Key findings: • Both groups were analyzed for breastfeeding rates at 48 hours after birth. • Intraoperative STS group had a 5% greater rate of exclusive breastfeeding (88%) compared to the control group at this time (83%) (p = 0.25) • Groups were analyzed again for breastfeeding rates at 10 days • Intraoperative STS had 69% while the control group has 66% (p = 0.74) • Groups were analyzed a third time at 6 weeks • Study group had 53% while the control group had 46% (p = 0.44) • Correlation between length of time of STS and feeding method at 48 hours and 6 weeks was also significant • At 48 hours participants who had STS < 8 hours had 94% of infants breastfeeding, those who had 8-12 hours of STS had 97% of infants breastfeeding, and those who had > 12 hours of STS had 100% breastfeeding (p = 0.04) • At 6 weeks participants who had STS < 8 hours had 58% of infants breastfeeding, those who had 8-12 hours of STS had 36% of	• Overall study quality rating: II (Good) This study provides evidence comparing groups who had intraoperative versus traditional STS with a cesarean section. Findings conclude that the study group that participated in intraoperative STS did have higher rates of breastfeeding than the group that did not. This information was straightforward and concise and identified that even though the findings were not statistically significant any increase in breastfeeding rates is positive due to the immense benefits for the newborn. Significance for Nursing Care and Research: • Intraoperative STS between mother and baby is associated with a trend in better breastfeeding outcomes and this practice can be safely performed in the operating room. • Nursing staff should be trained on implementation of intraoperative STS and ensure safety for mother and baby during the process. • Further research should investigate the association between intraoperative

Discussion

Strengths:

- Evidence concludes that the implementation of intraoperative skin-to-skin does not pose risk for impaired thermoregulation. Most neonates in the Billner-Garcia (2018) study were found to have maintained or increased temperature with intraoperative skin-to-skin.
- Intraoperative skin-to-skin reveals itself to be a strong promoter of breastfeeding initiation and maintenance. The Wagner (2018), Gregson (2016) and Frederick (2020) studies all mention the benefits of intraoperative STS on breastfeeding outcomes.
- The research studies utilized presented both maternal and neonatal outcomes related to intraoperative skin-to-skin. Conclusions focused on the findings that intraoperative skin-to-skin posed no significant risks to the infant or mother compared to delayed skin-to-skin. This supports the implementation of intraoperative skin-to-skin.

Limitations:

- Cesarean section practices and policies may vary across countries and health systems.
- Variations in how intraoperative skin-to-skin was performed differ widely.
- It's difficult to come to conclusions when research studies discussed multiple maternal and neonatal outcomes related to intraoperative skin-to-skin.
- Generalizability is limited as not all the studies were conducted in the U.S. and nursing care differs,
- It's difficult to draw conclusions as not all research studies yielded statistically significant results for neonatal adaptation and outcomes.

Conclusions

Level of evidence for entire body of research:

- Evidence provided by these articles supports the implementation of intraoperative skin-to-skin for mothers experiencing a cesarean section as there was found to be no negative impact on neonatal adaptation and neonates often benefitted with breastfeeding outcomes.
- Quality rating of these studies ranged from levels II-III, as not all studies included statistically significant data. However, all studies did mention that despite lack of statistically significant values, any slight increase in neonatal adaptations or outcome is valuable.

Neonatal Hyperbilirubinemia and Massages

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Background

- Hyperbilirubinemia is the leading cause of admission into a hospital among neonates around the globe. Common health problem seen in 60–80% of newborns (Abdellatif et al., 2020, p. 17)
- Neonatal jaundice is usually treatable, however it can lead to bilirubin encephalopathy which can progress to kernicterus. Also, incurable cases may develop permanent neurological and developmental disorders (Dağ & Yayan, 2019, p. 70).
- There are several treatment methods for infants with hyperbilirubinemia; phototherapy and blood exchange transfusion are two of these methods. Studies have shown that these treatments may control the disease, but they may cause a number of potential side effects such as: blood transfusion allergies, omphalocele, diarrhea, dehydration, skin eruption, blue baby syndrome. (Dağ & Yayan, 2019, p. 71).
- Infant massage helps reduce high bilirubin levels and come with positive effects that can improve weight gain, sleep patterns, growth and development, and autonomic nervous system functions, and it can also reduce the rates of colic and infant mortality. (Lin et al., 2015, p. 97)
- Use of massage for newborns who are treated with phototherapy for hyperbilirubinemia shows an increase in the frequency of defecation, urination, and feeding and reduced the total serum bilirubin levels (TBS). Showing that massage therapy is an effective supplementary intervention to decrease TSB levels in combination with phototherapy for newborns with hyperbilirubinemia (Korkmaz & Esenay, 2020, p. 94)

Purpose

- In neonates, what is the effect of massage therapy on jaundice babies on the reduction of bilirubin levels compared with no massage therapy.

Methods

- Inclusion Criteria:
  - Written between 2015-2020.
  - Had one nurse as an author or was published in a nursing journal.
  - Study was located in the United States or a comparable health care system.
  - Randomized Controlled Trials, Systematic Reviews
- Exclusion Criteria:
  - Articles were written in a language other than English.
  - Studies lacked a nursing author or were not published in a journal.
  - Studies were published before 2015.
- Search Process:
  - Sources: CINAHL.
  - Key words: jaundice or hyperbilirubinemia or bilirubin, massage therapy or massage or massage therapies.
  - 4 articles met all criteria to be included in the study.

Discussion

- Level of Research: Level one (systematic review)
- Current treatments for hyperbilirubinemia include phototherapy and blood transfusions in neonates are they viable and could they be more effective if combine with massage therapy.
- Massage therapy for neonates should be standard practice of care in hospital setting area, evidence has shown to be an effective method in aiding elimination of bilirubin.
- The data produced by these studies indicate that the use of massage therapy is beneficial in helping reduce high levels of bilirubin in neonates.

Results

(Dağ & Yayan, 2019, p. 73)

- Randomized controlled trial
- ($p > 0.05$)
- Study was conducted with 140 newborns who were receiving phototherapy in the neonatal intensive care unit
- Conclusion: The comparison of the bilirubin level mean scores of newborns in the intervention groups with the scores of the control group newborns showed that there was a significant difference between them. This study demonstrates that the bilirubin levels decreased most rapidly in the massage group making it effective treatment to be added one.

Comparison of the bilirubin values according to the groups.

Group N	Before the procedure	6 hours after the procedure	12 hours after the procedure
Control (n:35)	Mean ± SD 13.74 ± 3.24	Mean ± SD 11.44 ± 3.06	Mean ± SD 7.62 ± 2.54
Tub bath (n:35)	13.10 ± 2.41	7.70 ± 1.19	3.63 ± 1.50
Sponge bath (n:35)	13.13 ± 2.41	8.82 ± 1.81	4.42 ± 1.30
Massage (n:35)	14.75 ± 2.64	7.79 ± 2.04	3.82 ± 1.78
Test value	8,046	23.29	35.65
P value	0.000	0.000	0.000

(Abdellatif et al., 2020, p. 20)

- Systematic review of 363 papers retrieved through systematic research
- 27 randomized controlled trials were chosen to be included in the final quantitative analysis.
- Conclusion: Massage therapy could be an effective adjuvant to phototherapy to help reduce the time of phototherapy treatment. It however does not appear to replace the requirement for phototherapy.

(Korkmaz & Esenay, 2020, p. 99)

- Randomized controlled clinical trial
- ($p < 0.001$)
- The newborns in the intervention group had significantly lower levels of total bilirubin ($M = 9.02$ mg/dl ± 1.27 mg/dl) compared with the infants in the control group ($M = 11.04$ mg/dl ± 1.57 mg/dl, $p < .001$).
- Urination and defecation frequencies were greater in the newborn intervention group.
- Feeding frequencies in the intervention group ($M = 10.97$ times ± 1.62 times) were significantly greater than in the control group. ($M = 9.05$ times ± 1.82 times, $p < .001$).
- Conclusion: Use of massage for newborns treated with phototherapy may increase the frequency of defecation, urination, and feeding and reduce TSB levels. Massage therapy may be an effective intervention to lower TSB levels in combination with phototherapy for newborns with hyperbilirubinemia.

(Lin et al., 2015, p. 96)

- Randomized controlled trial
- ($p = 0.045$)
- Although the defecation frequency was not significantly different between the control and massage groups on the first and second days of the study, it was significantly higher in the massage group on the third day ($p = 0.04$).
- Conclusion: After the third day of the massages, the defecation frequency of the neonates receiving phototherapy and massages was significantly higher than the control group not receiving massage therapy.

Parameter	Massage group ($n = 15$)	Control group ($n = 11$)	t value	p value
D1 microbilirubine level (mg/dL)	15.6 ± 0.9	15.9 ± 1.0	-1.35	0.19
D2 microbilirubine level (mg/dL)	13.9 ± 1.2	14.5 ± 0.8	-1.36	0.18
D3 microbilirubine level (mg/dL)	10.8 ± 0.9	12.2 ± 1.8	-2.6	0.03*

Conclusions

- **Strengths:**
  - All the studies that were found showed very similar results in very different parts of the world. Neonatal massages also showed no negative side effects when compared to other effective treatments such as phototherapy.
  - There is no added cost or equipment needed for hospitals to purchase to be able to implement this practice into policy. Hospitals would only need to coordinate an inservice teaching to all nurses on their mother baby and NICU units.
- **Limitations:**
  - This topic does have its limitations due to it being a relatively new topic for discussion and does not have ample amount of research done.
  - After review of several studies, there is also no definition or method for the massages or talk about the duration of the massages.
- **Implications:**
  - This can be implemented on every mother baby unit across the globe. Elevated bilirubin levels are extremely common among neonates, ranging from 60-80%. Therefore this safe and effective practice should be used widely. This practice can also be taught to new parents taking home neonates after birth.
- **Recommendations for future studies:**
  - At this time, more studies need to be conducted in order to better explore the full benefit of massages on hyperbilirubinemia neonates.
  - Moving forward, a standardized method and duration of massages need to be implemented due to much deviation in massage techniques. A standardized method would provide more control for the studies against externalities.
  - Studies show significant benefits in both preventing jaundice and reducing bilirubin levels with no adverse side effects. Based on current research we recommend that all hospitals begin utilizing massage techniques into their practice.

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