

Spark the Fire: Building Research Interest and Skills Within Undergraduate Nursing Students in the Northwest Territories

Teala Gonzalez, Erin Moore, Andréanne Robitaille, Kathleen Scarf, and Anne Walsh

INTRODUCTION

Andréanne Robitaille and Anne Walsh

My name is Andréanne Robitaille; I had the privilege of instructing the Nursing Research course in the last year of the four-year Baccalaureate of Science in Nursing (BSN), University of Victoria at Aurora College. The intent of this course is to increase students' understanding of nursing scholarship and enhance their ability to comprehend, critique, and use nursing research. In this course, students critically reflect on various scholarly works and research methodologies. They examine their practice in relation to nursing research and learn to pose research questions for evidence-informed practice.

Within that mandate, I organized a Scholarship Day at the end of the Fall semester. It was my first one, but Scholarship Day is a "tradition" at the School of Health and Human Services. This event is a way to show and celebrate students' success and honour students' work.

All fourth year students in the BSN program (n=18) presented their research projects at a virtual poster session. The goal of the assignment was to complete a literature review on a health and wellbeing-related topic that was relevant to northern nursing practice. The students followed the Evidence-informed Practice Process (Mazurek Melnyk & Fineout-Overholt, 2019) for the development of their projects. Through the process, they learned how to cultivate a spirit of inquiry, develop a research question, search and collect the literature and evidence, appraise the evidence, organize their findings, and then create recommendations for the clinical, research, education and/or policy level applicable to our northern context.

In a conversation with Dr. Pertice Moffitt while organizing the 2021 Northern Nursing Scholarship Day, she suggested submitting the three award winner students' posters to the first issue of the Xàgots'eèhk'ò Journal. The award recipients would have the opportunity to learn from and about the peer review process inherent in the publication process for this journal. We are grateful to the Xàgots'eèhk'ò Journal reviewers for reviewing and accepting our paper.

To put these student posters in context, I wrote this short commentary and shared a few thoughts and questions that came to mind as I lived through the process. I asked the Aurora College Yellowknife campus librarian Anne Walsh to join me in writing, as she assisted students with their literature review for their project. She generously agreed to write and reflect with me.

2021 NORTHERN NURSING SCHOLARSHIP DAY

The 2021 Northern Nursing Scholarship Day was organized as a reflexive practice day open to all the students and staff of the BSN, Practical Nursing, and Personal Support Worker programs of the Aurora College School of Health and Human Services. On December 1, 2021 we had the honour of welcoming Dr. John B Zoe (Chairperson Hotii ts'eeda), Ms. Maggie Mercredi (Knowledge Holder), and Ms. Erica Abel (Alumni of Aurora College BSN program and Indigenous nurse clinician working at Stanton Territorial Hospital, Yellowknife, NT). This year over 100 Aurora College students and faculty at the School of Health and Human Services registered for the event.

The topics the students chose and the unique way they approached them underscore the importance of developing and applying research that is for the North, by the North, and with the North to improve the quality of care, as well as the necessity of decolonizing approaches to advance nursing knowledge. This first exercise as a new instructor and newcomer in a northern post-secondary institution prompted more questions than answers. How can we help ignite the spark in students so that they want to seek and improve their future northern clinical practice? How can we cultivate their spirit of inquiry? How can we help give them confidence in their ability to apply the evidence-informed practice process? How do we reconcile biomedical knowledge and Indigenous knowledge within this evidence-informed nursing practice process? What mechanisms should we put in place in our healthcare system and northern post-secondary institution to enable this dialogue?

On the following pages are the posters and abstracts of the recipients of the 2021 Northern Nursing Scholarship Day awards:

- **Kathleen Scarf** for People's Choice Award
- **Erin Moore** for Scientific Rigor Award
- **Teala Gonzalez** for Creativity Award

Two Awards committees for Rigor (Dr. Kerry Lynn Durnford, Carol Amirault, and Dr. Kathie Pender) and Creativity (Anne Walsh, Axelle Kearnan, Lea Barbosa Leclerc) evaluated the posters and presentations. There was also a People's Choice Award selected by an online survey by their peers after the presentations.

Congratulations to all the 4th-year BSN students for their presentations at the 2021 Northern Nursing Scholarship Day. We hope these initiatives continue to spark the fire of research and inquiry in the newly graduated nurses and one day, some nursing students themselves will become Northern nurse researchers!

Andréanne Robitaille: *I live in Yellowknife and am from from St-Augustin de Desmaures, Quebec. I am a Mom, daughter, sister, partner, friend, registered nurse, researcher/manager (Aurora Research Institute), and instructor (School of Health and Human Services, Aurora College). I am a guest on the land of the Yellowknife Dene First Nations People, Chief Drygeese Territory. My family and I are grateful to feel at home here. If you have comments, questions, or want to connect, here is my email address: arobitaille@auroracollege.nt.ca*

Anne Walsh: *I live in Yellowknife and I've lived in the North for almost 8 years. I am from Newfoundland but lived in a bunch of cities and towns in Ontario. I also raised my son in the West End of Vancouver for 20 years. As a librarian for over 30 years, I started to use research databases before the widespread use of the world wide web. In the early days, you had to "pay by the second" to search these proprietary databases. My research experience is in patents, chemical abstracts, engineering standards, nutraceuticals, silviculture, geology, computer security, and health. I enjoy sharing my knowledge with Aurora College students and collaborating with faculty on the nuances of finding information.*

REFERENCES

Mazurek Melnyk, B & Fineout-Overholt, E (2019). Evidence-Based Practice in Nursing and Healthcare : A Guide to Best Practice (4th Edition), Wolters Kluwer.

PEOPLE'S CHOICE AWARD***To Administer or not to Administer? That is the Antipyretic/Analgesic Question with Childhood Vaccinations*****Kathleen Scarf, 4th year BSN program University of Victoria at Aurora College**

Introduction: Antipyretic analgesics are often used to treat childhood vaccine-associated fever and pain, however, such use can blunt the appropriate immune response of vaccines. This literature review seeks to discover the effect that prophylactic or delayed administration of acetaminophen or ibuprofen may have on childhood vaccination immune responses. **Method:** A literature review was conducted using the CINAHL database. Criteria included peer-reviewed, published within the last 10 years (preferred), randomized controlled trials and external validity, and infant/child subjects. **Results:** Decreased immune response occurred with prophylactic acetaminophen use and pneumococcal conjugate vaccines and DTap-HBV-IPV-Hib vaccines in five Random Control Trials, while one revealed no effects to the MenB, DTap-HBV-IPV-Hib and PCV7 vaccines. Ibuprofen did not affect the immune response with pneumococcal conjugate vaccines and an inactivated influenza vaccine. Primary series and prophylactic use were common themes with decreased immune response, while booster series and delayed use primarily did not affect immunogenicity. However, when immune blunting occurred a majority of antibody levels remained clinically protective. **Discussion:** Caution is warranted with unnecessary antipyretic/analgesic prophylactic use during childhood vaccination until additional research can include greater vaccine coverage. Further investigation of the clinical significance of reduced immunogenicity on disease protection is needed.

Kathleen Scarf: *I live in Yellowknife, and I've called the Northwest Territories home for the last 8 years. I feel very fortunate to raise my children here while finishing my nursing degree. The idea for this project stemmed from past experiences during my own children's immunizations and the inconsistencies met regarding prophylactic antipyretics/analgesics. My literature review brought me greater understanding of the profound role research has in evidence-based practice and the need for continuity of practice throughout the entire Northwest Territories.*

To Administer or not to Administer: That is the Antipyretic/Analgesic Question with Childhood Vaccinations

Kathleen Scarf, 4th Year BSN Student, University of Victoria at Aurora College, Dec. 2021

Statement of the problem

The administration of acetaminophen is recommended by the Northwest Territories Health and Social Services Authority (NTHSSA) to treat vaccine-associated fever and pain in infants and children¹; however, the routine use of acetaminophen or ibuprofen with vaccinations can blunt the body's necessary immune response (immunogenicity).² Currently, Public Health of the Northwest Territories (NWT) has not implemented its own immunization policies and instead follows the Canadian Immunization Guide,³ which does not address these specific immunogenicity concerns.⁴ Understanding which vaccines are affected, the extent of immune blunting, and the role that timing may play when administering acetaminophen or ibuprofen will help to guide NWT healthcare professional's best practice, especially within the context of the current influenza campaign and covid-19 vaccine eligibility for children ages 5 to 11.

Research question

What is the effect of prophylactic or delayed administration of acetaminophen or ibuprofen on the immune response of vaccinations in infants and children compared to subjects who received no antipyretic/analgesic intervention?

Methodology

The CINAHL database was used to search keywords: "immune response or effect" and "antipyretic or analgesic or acetaminophen or non-steroidal anti-inflammatory" and "vaccine" or "immunization" and "child" or "infant". Advanced criteria included peer-reviewed, published within the last 10 years (preferred), randomized controlled trials (RCTs) and external validity.

Results

The effect of acetaminophen on immunogenicity

Prophylactic acetaminophen administration with the pneumococcal conjugate vaccine (PCV) was shown to decrease immune responses; however, a high percentage still achieved protective antibody levels,^{5,9} whereas its delayed use (between 4-8h) revealed little to no immunogenicity effects.^{5,9} Decreased immunogenicity to the DTaP-HBV-IPV-Hib vaccine was also observed.⁸ The blunted responses were more evident with primary vaccine dosing than with booster dosing,^{5,7,9} except in one study where both doses were negatively affected.⁸ However, no significance was found when acetaminophen was concomitantly given with PCV, DTaP-HBV-IPV-Hib and MenB vaccines⁹ and no immunogenicity concerns occurred with the inactivated influenza vaccine (IIV) and concomitant or delayed acetaminophen administration.¹⁰

The effect of ibuprofen on immunogenicity

No significant immune blunting was found with the prophylactic or delayed use of ibuprofen and the IIV,¹⁰ or the prophylactic use of ibuprofen on the PCV.^{5,9} Ibuprofen prophylaxis did have a decreased immune effect on the DTaP-HBV-IPV-Hib primary series, specifically with the pertussis and tetanus pathogens; however, antibodies were able to reach clinical protection levels, especially after the booster series.^{5,9}

Evidence-based practice

An article in the *Journal for Nurse Practitioners* recommends best practice to be the prophylactic administration of antipyretic analgesics with parental concerns of mild vaccine-related effects.¹¹ This is regardless of the known blunting due to lack of verifying literature.¹¹ The Canadian Immunization Guide does not recommend prophylactic analgesic use for vaccine-related pain as there is no evidenced benefit; however, it does not address possible analgesic immune blunting.⁴

Recommendations for Northern Nursing Practice

- Educate caregivers to administer acetaminophen or ibuprofen as needed if pain or fever occur with childhood vaccination, while cautioning against prophylactic use due to limited research available on immune blunting.
- Ensure alternative and non-pharmacological pain management interventions are included with all client teaching.
- Remain up to date on vaccine literature to guide best evidence-based practice.
- NWT Public Health to implement in-house vaccination policies guided by evidence-based literature to standardize and ensure continuity of best practice throughout the NWT.
- Advocate for further research, with a focus on the specific vaccine gaps found within the NWT's Immunization Schedule.

Acknowledgments

I would like to thank Pam Baert, Public Health Nurse with the Maternal Child Team at NTHSSA and Chris Bessey, Pharmacist with Stanton Territorial Hospital for their contributions to this project.

Literature cited

- NTHSSA (2017)
- Burchum, J. & Rosenthal, L. (2018)
- Baert, P. (personal communication, October 28, 2021)
- Government of Canada. (2021, March 26)
- Falup-Pecurariu, O. et al. (2017)
- Przymula et al. (2014)
- Przymula et al. (2013)
- Przymula et al. (2009)
- Wysocki et al. (2017)
- Walter et al. (2017)
- Eden et al. (2017)
- HSS (2018)

Conclusion

Though limited, research revealed the prophylactic use of acetaminophen with primary vaccination was most commonly associated with decreased immune response, although the extent of blunting varied, antibody levels commonly reached protective levels.^{5,10} Ibuprofen use, delayed administration (4-8h) and booster series most commonly revealed no immunogenicity concerns.^{5,10} Caution should be warranted with unnecessary antipyretic/analgesic prophylactic use during childhood vaccination until additional, statistically powered research can include greater vaccine coverage and further investigate the clinical significance of reduced immunogenicity on disease protection.



REFERENCES

- Burchum J., & Rosenthal, L. (2019). *Lehne's pharmacology for nursing care*. (10th ed.). Elsevier.
- Eden, L. M., Lind, M. G., Luthy, K. E., & Macintosh, J. L. B. (2017). Best practice for prevention of vaccination common problems with antipyretic/analgesic medications. *The Journal for Nurse Practitioners*, 13(7), 462-467. <https://doi.org/10.1016/j.nurpra.2017.05.005>
- Falup-Pecurariu, O., Man, S. C., Neamtu, M. L., Chicin, G., Baciu, G., Pitic, C., Cara, A. C., Neculau, A. E., Burlea, M., Brinza, I. L., Schnell, C. N., Sas, V., Lupu, V. V., Francois, N., Swinnen, K., & Borys, D. (2017). Effects of prophylactic ibuprofen and paracetamol administration on the immunogenicity and reactogenicity of the 10-valent pneumococcal non-typeable *Haemophilus influenzae* protein D conjugated vaccine (PHiD-CV) co-administered with DTPa-combined vaccines in children: An open-label, randomized, controlled, non-inferiority trial. *Human Vaccines & Immunotherapeutics*, 13(3), 649-660. <https://doi.org/10.1080/21645515.2016.1223001>
- Government of Canada. (2021, March 26). Canadian immunization guide. <https://www.canada.ca/en/public-health/services/canadian-immunization-guide.html>
- Health and Social Services (2018, April). NWT immunization schedule. Government of Northwest Territories. <https://www.hss.gov.nt.ca/sites/hss/files/immunization-schedule-general-public.pdf>
- Northwest Territories Health and Social Services Authority. (2017, April). Diphtheria, tetanus, pertussis, polio and haemophilus influenza type B (DTaP-IPV-Hib). <https://www.hss.gov.nt.ca/sites/hss/files/dtap-ipv-hib.pdf>
- Prymula, R., Esposito, S., Zucotti, G. V., Xie, F., Toneatto, D., Kohl, I., & Dull, P. M. (2014). A phase 2 randomized controlled trial of a multicomponent meningococcal serogroup B vaccine (I). *Human Vaccines & Immunotherapeutics*, 10(7), 1993-2004. <https://doi.org/10.4161/hv.28666>
- Prymula, R., Habib, A., Francois, N., Borys, D., & Schuerman, L. (2013). Immunological memory and nasopharyngeal carriage in 4-year-old children previously primed and boosted with 10-valent pneumococcal non-typeable *Haemophilus influenzae* protein D conjugate vaccine (PHiD-CV) with or without concomitant prophylactic paracetamol. *Vaccine*, 31(16), 2080-2088. <https://doi.org/10.1016/j.vaccine.2013.01.044>
- Prymula, R., Siegrist, C., Chlibek, R., Zemlickova, H., Vackova, M., Smetana, J., Lommel, P., Kasliskova, E., Borys, D., & Schuerman, L. (2009). Effect of prophylactic paracetamol administration at time of vaccination on febrile reactions and antibody responses in children: two open-label, randomised controlled trials. *The Lancet*, 374(9698), 1339-1350. [https://doi.org/10.1016/S0140-6736\(09\)61208-3](https://doi.org/10.1016/S0140-6736(09)61208-3)
- Walter, E. B., Hornik, C. P., Grohskopf, L., McGee, C. E., Todd, C. A., Museru, O. I., Harrington, L., & Broder, K. R. (2017). The effect of antipyretics on immune response and fever following receipt of inactivated influenza vaccine in young children. *Vaccine*, 35, 6664-6671. <https://doi.org/10.1016/j.vaccine.2017.10.020>
- Wysocki, J., Center, K. J., Brzostek, J., Mjada-Stanislawsa, E., Szymanski, H., Szenbonr, L., Czajaka, H., Hasiec, B., Dziduch, J., Jackowska, T., Witor, A., Kopinska, E., Konior, R., Giardina, P. C., Sundaraiyer, V., Patterosn, S., Gruber, W. C., Scott, D. A., & Gurtman, A. (2017). A randomized study of fever prophylaxis and the immunogenicity of routine pediatric vaccinations. *Vaccine*, 35, 1926-1935. <https://doi.org/10.1016/j.vaccine.2017.02.035>

SCIENTIFIC RIGOUR AWARD***The ART of Infertility: Frozen-Thawed or Fresh Embryo Transfers*****Erin Moore, Fourth year BSN program University of Victoria at Aurora College**

Introduction: In vitro fertilization (IVF) seeks to achieve conception and maternal and fetal safety, ultimately resulting in live births. However, concerns have arisen regarding the methodology of fresh and frozen-thawed embryo transfers and how their health outcomes compare. **Method:** A literature review using the CINAHL and MEDLINE databases to identify available data and compare the outcomes of frozen-thawed embryo transfers with fresh embryo transfers. Ten relevant peer-reviewed articles published between 2015 and 2021 were found. **Results:** Frozen-thawed embryo transfers appeared to have a decreased risk of ectopic pregnancy, miscarriage, ovarian hyper stimulation syndrome, and preterm birth, in comparison to fresh embryo transfer which also had a fivefold increase in venous thromboembolism (VTE) and pulmonary embolism (PE). Frozen-thawed transfers had an increased risk for hypertensive disorders, macrosomia, and large for gestational age (LGA), which increased the risk for a cesarean section. This research demonstrated conflicting results across the literature and several limitations to the studies. **Discussion:** The research literature indicated that frozen-thawed embryo transfers were becoming the preferred method of IVF, with a possible movement to a freeze-all policy, as it demonstrated an increase in conception and live birth rates. Further research is warranted to comprehend underlying causes of adverse health outcomes associated with IVF.

Erin Moore: *I live in Yellowknife, Northwest Territories, and I was born and raised here. I recently graduated from Aurora College and currently serve my community as a registered nurse. As I raise my family in the North, I look forward to expanding my knowledge and furthering my education in the profession in the hope of one day becoming an educator to future nurses.*

The ART of Infertility: Frozen-Thawed or Fresh Embryo Transfers

Erin Moore - 4th Year BSN Student, Yellowknife, NT, December 1, 2021

<p>Statement of the Problem</p> <p>In vitro fertilization (IVF) is a complex dynamic of protocols, procedures, and treatments utilized to address infertility, which affects 1 in 6 couples in Canada. While the goal is to achieve conception and maternal and fetal safety, resulting in a live birth, concerns have been raised about health outcomes, specifically in the comparison of fresh and frozen-thawed embryo transfers. Though there are currently no IVF clinics in the Northwest Territories (NT), nurses are still responsible for advancing their knowledge regarding Assisted Reproductive Technologies (ART), such as IVF, to facilitate patient understanding of the risks and benefits regarding the methods of transfer² and to guide best practice in supporting individuals through the IVF process and in pregnancy.</p>	<p>Literature Review</p> <p>Frozen-Thawed Embryo Transfers</p> <ul style="list-style-type: none"> Increased risk of hypertensive disorders of pregnancy (HDP)^{1,4} and decreased occurrence of moderate to severe ovarian hyperstimulation syndrome (OHSS).^{4,5} Significantly increased clinical pregnancy and live birth rates,⁴ with a decreased risk of miscarriage, ectopic pregnancy, and preterm birth.^{4,5} Decreased risk for low birth weight (LBW)^{6,8} yet a significantly increased risk of macrosomia and large for gestational age (LGA), resulting in an increased risk of cesarean section.⁷ <p>Fresh Embryo Transfer</p> <ul style="list-style-type: none"> Associated with an increased risk for LBW, small for gestational age (SGA),¹⁰ ectopic pregnancy,⁴ ovarian hyperstimulation syndrome, and miscarriage.⁴ Fivefold increased incidence of venous thromboembolism (VTE) and pulmonary embolism (PE) during the first trimester.¹¹ <p>Limitations</p> <p>The majority of the literature supported the movement to a freeze-all policy for embryos, as it was hypothesized that routine controlled ovarian stimulation for egg retrieval had deleterious effects, creating a suboptimal uterine environment for fresh embryo transfers by potentially reducing endometrial receptivity.^{10,12} However, a few researchers cautioned this approach as the underlying mechanisms of the adverse outcomes are still unknown,¹ even with an increase in literature over the past decade, some of which have conflicting findings. Additionally, researchers conducting meta-analysis¹ identified several limitations in the studies, including methodological errors⁴ and uncontrolled confounding variables,⁶ which resulted in a few articles being retracted from publication.</p>	<p>Recommendations for Northern Nursing Practice</p> <ul style="list-style-type: none"> Further stringent quantitative research is recommended to substantiate and improve the safety of cryopreservation by identifying the underlying causes of adverse health outcomes to inform practice and develop healthy policies.^{4,7} Conduct longitudinal research to determine any long-term adverse health effects of children conceived through IVF utilizing cryopreservation.⁷ Utilize newly conducted research to develop comprehensive pregnancy care plans and interventions³ for individuals who have undergone frozen-thawed or fresh embryo transfers to educate and guide the practice of health care providers across the NT. Provide up-to-date learning opportunities focused on patient care in pregnancies conceived through IVF, specifically the risks and benefits of frozen-thawed and fresh embryo transfers.
<p>Research Question</p> <p>In women experiencing infertility and undergoing IVF, are frozen-thawed embryo transfers safer and more successful in achieving a live birth outcome, than fresh embryo transfers?</p>		<p>Conclusion</p> <p>The IVF methods of frozen-thawed and fresh embryo transfers possess various fetal and maternal health risks. A significant amount of the literature proposes the superiority of frozen-thawed transfers, however, conflicting results remain among some studies. Further research on the total safety and long-term effects of cryopreservation, will guide the development of care plans and interventions used to best support individuals returning to the NT from undergoing IVF procedures.</p>
<p>Methodology.</p> <p>A literature search was conducted using CINAHL and MEDLINE databases resulting in 10 relevant peer-reviewed articles that were published between 2015 and 2021. Key words utilized included "fresh embryo transfer", "frozen-thawed embryo transfer", "perinatal outcomes", "obstetric outcomes", "pregnancy", "assisted reproductive technology", "freeze-all policy", "cryopreservation", and "in vitro fertilization".</p>	 <p>(Cariva, 2021)</p>	<p>Literature Cited</p> <ol style="list-style-type: none"> Government of Canada (2019) Canadian Nurses Association (2014) Chih et al. (2021) Zhang et al. (2018) Londra et al. (2015) Lizky et al. (2018) Spijkers et al. (2017) Fang et al. (2015) Wentz et al. (2021) Shapiro et al. (2016) Olaussen et al. (2020) Roque et al. (2015)

REFERENCES

- Canadian Nurses Association. (2014). *Position statement: The role of the nurse in reproductive and genetic technologies*. https://www.cna-aiic.ca/-/media/cna/page-content/pdf-fr/ps58_role_nurse_reproductive_genetic_technologies_march_2002_e.pdf
- Chih, H. J., Elias, F. T. S., Gaudet, L., & Velez, M. P. (2021). Assisted reproductive technology and hypertensive disorders of pregnancy: Systematic review and meta-analyses. *BMC Pregnancy and Childbirth*, 21(1), Article 449. <https://doi.org/10.1186/s12884-021-03938-8>
- Fang, C., Huang, R., Wei, L.-N., & Jia, L. (2015). Frozen-thawed day 5 blastocyst transfer is associated with a lower risk of ectopic pregnancy than day 3 transfer and fresh transfer. *Fertility and Sterility*, 103(3), 655-661. <https://doi.org/10.1016/j.fertnstert.2014.11.023>
- Government of Canada. (2019, May). *Fertility*. <https://www.canada.ca/en/public-health/services/fertility/fertility.html>
- Litzky, J. F., Boulet, S. L., Esfandiari, N., Zhang, Y., Kissin, D. M., Theiler, R. N., & Marsit, C. J. (2018). Effect of frozen/thawed embryo transfer on birthweight, macrosomia, and low birthweight rates in US singleton infants. *American Journal of Obstetrics & Gynecology*, 218(4), 433.e1-433.e10. <https://doi.org/10.1016/j.ajog.2017.12.223>
- Londra, L., Moreau, C., Strobino, D., Garcia, J., Zacur, H., & Zhao, Y. (2015). Ectopic pregnancy after in vitro fertilization: Differences between fresh and frozen-thawed cycles. *Fertility and Sterility*, 104(1), 110-118. <https://doi.org/10.1016/j.fertnstert.2015.04.009>
- Olausson, N., Discacciati, A., Nyman, A. I., Lundberg, F., Hovatta, O., Westerlund, E., Wallén, H. N., Mobarrez, F., Bottai, M., Ekblom, A., & Henriksson, P. (2020). Incidence of pulmonary and venous thromboembolism in pregnancies after in vitro fertilization with fresh respectively frozen-thawed embryo transfer: Nationwide cohort study. *Journal of Thrombosis and Haemostasis*, 18(8), 1965-1973. <https://doi.org/10.1111/jth.14840>
- Roque, M., Valle, M., Guimarães, F., Sampaio, M., & Geber, S. (2015). Freeze-all policy: Fresh vs. frozen-thawed embryo transfer. *Fertility and Sterility*, 103(5), 1190-1193. <https://doi.org/10.1016/j.fertnstert.2015.01.045>
- Shapiro, B. S., Daneshmand, S. T., Bedient, C. E., & Garner, F. C. (2016). Comparison of birth weights in patients randomly assigned to fresh or frozen-thawed embryo transfer. *Fertility and Sterility*, 106(2), 317-321. <https://doi.org/10.1016/j.fertnstert.2016.03.049>
- Spijkers, S., Lens, J. W., Schats, R., & Lambalk, C. B. (2017). Fresh and frozen-thawed embryo transfer compared to natural conception: Differences in perinatal outcome? *Gynecologic and Obstetric Investigation*, 82(6), 538-546. <https://doi.org/10.1159/000468935>
- Wertheimer, A., Hochberg, A., Krispin, E., Sapir, O., Ben-Haroush, A., Altman, E., Schohat, T., & Shufaro, Y. (2021). Frozen-thawed embryo transfer is an independent risk factor for third stage of labor complications. *Archives of Gynecology and Obstetrics*, 304(2), 531-537. <https://doi.org/10.1007/s00404-020-05935-2>
- Zhang, W., Xiao, X., Zhang, J., Wang, W., Wu, J., Peng, L., & Wang, X. (2018). Clinical outcomes of frozen embryo versus fresh embryo transfer following in vitro fertilization: A meta-analysis of randomized controlled trials. *Archives of Gynecology and Obstetrics*, 298(2), 259-272. <https://doi.org/10.1007/s00404-018-4786-5>

CREATIVITY AWARD***PAW-Isy On Approach to Cerebral Palsy: The Effects of Animal Assisted Therapy in Children with Cerebral Palsy*****Teala Gonzalez, Fourth year BSN program University of Victoria at Aurora College**

Introduction: Cerebral Palsy (CP) is the most common motor disability in childhood. Although there is no cure for CP, therapies used for the treatment and rehabilitation of children diagnosed with CP are physiotherapies and occupational therapy. **Method:** This literature review aimed to evaluate the effects of another complementary therapy called Animal Assisted Therapy (AAT) for children with CP and the effects it has on rehabilitation and overall care. Although the main interest pertains to children with CP, the search results of AAT and their effects on children with disabilities in general were used as well. CINAHL was the main database used as it allowed for a more in-depth search result and only peer-reviewed articles from reputable sources were selected (n=9). Keywords were: cerebral palsy, children, pet therapy, animal assisted therapy, disability, service animals, and dog therapy. **Results:** There were many positive impacts to AAT found in the literature on cognitive, physical, and psychosocial dimensions of children with CP. **Discussion:** Although the findings suggest many positive increases to the overall quality of life for children with CP, due to limitations like small sample sizes and lack of quality data, there is a strong need for further research.

Teala Gonzalez: *I live in Yellowknife, Northwest Territories. Being born and raised in Yellowknife has given me a great deal of love for the northern lifestyle and all it has to offer. I am a proud graduate of the Bachelors of Science in Nursing program from the University of Victoria at Aurora College. Currently, I work at Stanton Territorial Hospital in Yellowknife, NT where I had the privilege of doing many nursing placements during my education. I hope to continue to pursue my nursing career in the north and explore remote northern communities.*

PAW-LSY ON APPROACH TO CEREBRAL PALSY: THE EFFECTS OF ANIMAL ASSISTED THERAPY IN CHILDREN WITH CEREBRAL PALSY

Teala Gonzalez

University of Victoria at Aurora College 2021

Research Question

In children with Cerebral Palsy, what are the effects of Animal Assisted Therapies and service animals on rehabilitation and overall care?

Statement of the Problem

Cerebral Palsy (CP) is the most common motor disability in childhood and can be difficult to diagnose at a young age¹. With rates of disabilities increasing to 14% for the population of the NWT, there is a drastic need to evaluate and incorporate complementary therapies for this population². There are many different manifestations and co-morbidities that can come from a diagnosis of CP. Motor, cognitive, and psychosocial developmental delays, high prevalence of seizure disorders, and sensory deprivation, are all manifestations that can occur with CP¹. Generally, physiotherapy, assistive devices, and some medications are commonly used to treat and rehabilitate those with CP. However, there are many complementary therapies to consider as nurses when using a holistic approach to health³. The use of service animals and Animal Assisted Therapies (AAT) in conjunction with rehabilitation have been researched for children with this condition. As children with CP have many varying forms of underlying conditions and disabilities that can impact their everyday life, what effect does AAT have on the success of rehabilitation and overall care of these children and how can this influence the north?



Methodology

It is difficult to estimate exactly how many people have CP. Many people with mild CP are never diagnosed, while others may have multiple disabilities which overshadow their CP³. Due to this, and although the main question pertains to children with cerebral palsy, the search results of AAT and their effects on children with disabilities related to cerebral palsy were used as well. EBSCO was the main database used as it allowed for a more in-depth search result and only peer-reviewed articles from reputable sources were used. The keywords used to facilitate this search were Cerebral Palsy, children, Pet Therapy, Animal Assisted Therapy, disability, service animals, and dog therapy.

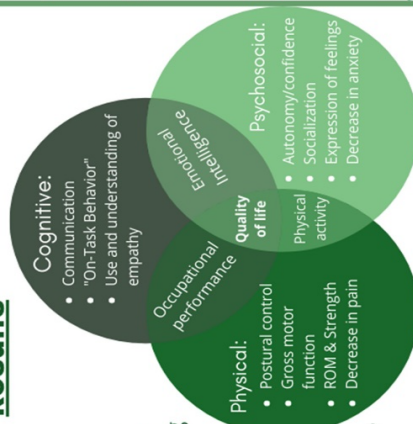
References:
 1. CDC (2021). 4. Hemminki (2001).
 2. GWPT (2017). 5. Borsari et al. (2013). 6. Hui et al. (2020).
 7. Lightsey et al. (2021). 12. Bunting et al. (2019).
 10. Joseph et al. (2016).
 11. Goodland & Scher (2015).

Results

Benefits:

Significant impacts from Animal Assisted Therapy seen in three overlapping common themes:

- Increase in cognitive aspects^{1,2,3,5,7}
- Increase in physical aspects^{2,3,4,5,6,7,9}
- Increase in psychosocial aspects^{1,2,4,6,7,9}



Concerns:

A few common themes of concerns were seen throughout the literature for pet therapy:

- Not enough research^{1,8,9}
- Allergies/asthma^{1,7,8,9}
- Financial Constraints⁷
- Individual needs of children varies^{1,3,4,6}
- Access to services⁷
- Facilities policies on animals⁹

Limitations:

Within the literature, there were three common limitations to the research:

- 1 Small sample size^{1,2,3,4,5,6,7,8,9}
- 2 Lack of research & quality data^{1,3,8}
- 3 Varying disabilities^{2,3,5,6}

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Recommendations for Northern Nursing Practice

There are many recommendations for northern nursing that can be made from reviewing the literature. Rates of disabilities are increasing rapidly within the NWT (14.2% in 2017) and are projected to continue to increase. From these statistics and the literature discussed, there is a need to address the possibilities for complementary therapies for this population within the north. Three recommendations for northern nursing practice are advocating for AAT use, increasing nursing education on complementary therapies, and the need for further research on this topic.

AAT Use within Nursing Practice:

- Collaborating with inter-professional team (Rec therapy, OT/PT, government organizations)
 - Discuss use of complementary therapies for clients
 - Advocate for use of potential future AAT outpatient programs (SPCA & North Country Stables)

Increasing Education:

- Increase of curriculum content on complementary therapies within nursing programs
- Advocate for professional development focused on complementary therapies
- Collaborate with inter-professional team to learn roles and uses of therapies for clients

Further Research:

From reviewing the literature, there was one main common theme of recommendations for further research needed. The addition of further research with larger sample sizes and follow-up studies on long-term effects of AAT are needed to prove the positive impacts from AAT that are being witnessed are valid results.



Conclusion

Although throughout the literature there were many positives to utilizing AAT for this client population, unfortunately, the common theme of limitations has created a lack of research and evidence to make concrete recommendations. However, from this research, it is clear to see there is a place within northern nursing to advocate for further research for implementing and using AAT for children with CP or related disabilities.

REFERENCES

- Butterly, F., Percy, C., & Ward, G. (2013). Brief report: Do service dog providers placing dogs with children with developmental disabilities use outcome measures and, if so, what are they? *Journal of Autism & Developmental Disorders*, 43(11), 2720–2725. <https://doi.org/10.1007/s10803-013-1803-1>
- Centers for Disease Control and Prevention. (2021). What is cerebral palsy? <https://www.cdc.gov/ncbddd/cp/facts.html>
- Dilek Tunçay Elmacı, & Sibel Cevizci. (2015). Dog-assisted therapies and activities in rehabilitation of children with cerebral palsy and physical and mental disabilities. *International Journal of Environmental Research and Public Health*, 12(5), 5046–5060. <https://doi.org/10.3390/ijerph120505046>
- Government of the Northwest Territories. (2017). Equity, accessibility, inclusion, and participation: NWT disability strategic framework: 2017 to 2027. <https://www.hss.gov.nt.ca/sites/hss/files/resources/equity-accessibility-inclusion-participation-nwt-disability-framework.pdf>
- Heimlich, K. (2001). Animal-assisted therapy and the severely disabled child: A quantitative study. *Journal of Rehabilitation*, 67(4), 48–54.
- Hill, J., Ziviani, J., Driscoll, C., Teoh, A. L., Chua, J. M., & Cawdell-Smith, J. (2020). Canine assisted occupational therapy for children on the autism spectrum: A pilot randomized control trial. *Journal of Autism & Developmental Disorders*, 50(11), 4106–4120. <https://doi.org/10.1007/s10803-020-04483-7>
- Joseph J., Thomas N., & Thomas, A. (2016). Changing dimensions in human-animal relationships: Animal-assisted therapy for children with cerebral palsy. *International Journal of Child Development and Mental Health*, 4(2), 52–62.
- Lightsey, P., Lee, Y., Krenek, N., & Hur, P. (2021). Physical therapy treatments incorporating equine movement: A pilot study exploring interactions between children with cerebral palsy and the horse. *Journal of NeuroEngineering & Rehabilitation*, 18(1), 1–11. <https://doi.org/10.1186/s12984-021-00929-w>
- Lobato Rincón, L. L., Rivera Martín, B., Medina Sánchez, M. Á., Villafaina, S., Merellano-Navarro, E., & Collado-Mateo, D. (2021). Effects of dog-assisted education on physical and communicative skills in children with severe and multiple disabilities: A pilot study. *Animals*, 11(6), 1–10. <https://doi.org/10.3390/ani11061741>
- Ontario Federation for Cerebral Palsy. (2011). A guide to cerebral palsy. <https://www.ofcp.ca/pdf/Web-Guide-To-CP.pdf>
- Tepfer, A., Ross, S., MacDonald, M., Udell, M. A. R., Ruaux, C., & Baltzer, W. (2017). Family dog-assisted adapted physical activity: A case study. *Animals*, 7(5), 1–10. <https://doi.org/10.3390/ani7050035>
- Tielsch Goddard, A., & Gilmer, M. J. (2015). The role and impact of animals with pediatric patients. *Pediatric Nursing*, 41(2), 65–71.