

Understanding the Barriers to RDs Practicing In the Neonatal Intensive Care Unit Suny Oneonta

Theresa Loomis RD¹, Autumn Smith², Emily Lalonde²
and Toivo Pasto²

¹Department of Human Ecology, Room 104D, SUNY College, Oneonta.

²Dietetics and Dietetic Intern, Oneonta.

*Corresponding author

Theresa Loomis RD, Director, M.S.-Nutrition and Dietetics Program, Assistant Professor, Department of Human Ecology Room 104D, SUNY College, Oneonta, Tel: 607-436-2808; Fax: 607-436-2141; E-mail: Theresa.Loomis@oneonta.edu.

Submitted: 14 Jan 2017; Accepted: 24 Jan 2017; Published: 28 Jan 2017

Abstract

Purpose: To determine and assess the reasons behind the lack of Registered Dietitian (RD) presence in the Neonatal Intensive Care Unit (NICU).

Subjects: 272 RDs voluntarily completed the online questionnaire regarding their knowledge, comfort level and experience working with preterm infants.

Design: 2500 researcher developed surveys were emailed to Registered Dietitians across the United States. Only 248 surveys were returned which prompted the need to send out additional requests to complete the survey, which were administered via social media. This resulted in 24 more responses.

Methods: The electronic survey consisted of a mix of 23 open- and close-ended questions. The survey was single-blinded and all of the responses remained confidential. Institutional Review Board (IRB) approval was obtained prior to the administration of the survey from the State University of New York at Oneonta. Descriptive statistics were used to analyze the data. Results of the survey questions within this study reflect only the number of respondents to the particular question asked, not necessarily the total 262 that participated.

Results: Less than half of the respondents had experience working with premature infants (40.6%). Of the RDs who were not comfortable working in the NICU, 55.2% responded that it was due to insufficient knowledge regarding neonatal nutrition. Continuing education was cited as the most desirable mode of obtaining education on working with this population (79.2%). Conclusion: An increase in continuing education opportunities for RDs on nutrition for preterm infants is paramount.

Introduction

The goal for medical providers in neonatal intensive care units (NICU) is to increase the amount of lean body mass by providing the infant with adequate energy substrates to help increase the protein: calorie ratio [1]. The exact nutritional needs of a preterm infant are challenging to achieve because of the immaturity of their gastrointestinal tract, the increased energy needs for growth, and the elevated nutritional deficits due to their decreased time in utero. Growth of preterm infants within the first weeks of life is crucial in NICUs worldwide; therefore the assistance of Registered Dietitians (RDs) is critical [2]. Many preterm infants born between 24 and 32 weeks of gestation do not obtain the median birth weight of the reference fetus at the same corrected gestational age (CGA) [3]. Concerns arise when an infant's weight falls below the 10th percentile after birth for CGA [4]. Low birth weight (LBW) often leads to extra-uterine growth retardation (EUGR), which has been shown to correlate with poor neurological development [3]. In order to combat the complications associated with EUGR, provider's

aim for the infant to achieve a height and weight equal to their birth percentile or greater than the 10th percentile if born small for gestational age (SGA) prior to discharge. Infants that achieve this goal have been found to have a higher chance of preventing further complications related to preterm birth [5]. In order to reach this, specifically defined nutritional supplementation must be provided.

Human milk is the preferred source of nutrients for enteral nutrition (EN) feedings, due to its ease of digestion and the multiple components that assist with the development of the gastrointestinal tract and immune system. However, it is commonly accepted that it must be fortified to meet the increased nutrient needs for preterm infants. In order to prevent many of the complications caused by a preterm birth delivery, a daily intake of 3.2-3.8 g/kg protein and 90-100 kcal via parenteral nutrition or 3.4-4.2 g/kg and 110-130 kcal enteral nutrition (EN) for LBW infants is recommended [6]. NICU RDs work alongside physicians, nurses, and other health professionals to provide valuable knowledge in the timing and administration of EN and PN to meet specific preterm infants'

nutritional needs to achieve optimum growth. The presence of RDs on nutrition support teams has historically been found to decrease premature infant mortality due to the aggressive nutrition therapy that trained NICU RDs are able to perform in addition to other medical care providers [7]. Research indicates that when NICU RD recommendations are carried out, infants are four times more likely to achieve optimal energy intake and increase overall visceral protein status [8]. The implementation of an RD in the NICU ensures that patients receive individualized nutrition care, thereby improving growth rates and shortening hospital stays. Despite these results, only 38% of NICUs have an RD on staff working to establish nutrition care recommendations [8]. In order to understand the barriers associated with the lack of presence of RDs in the NICU, a survey was sent out to RDs nationwide about their exposure to and experience, if any, in the NICU.

Methods

Survey Administration

A survey was developed to determine RDs experiences with preterm infants, their opinion of the importance of having an RD to work with these patients, reasons why RDs are uncomfortable working in the NICU, and potential training methods/resources that would be desirable for RDs looking to work in neonatal nutrition. The survey was reviewed and approved by the Institutional Review Board (IRB) at the State University of New York at Oneonta. Email addresses for 2,500 RDs nationwide were obtained from the Commission on Dietetic Registration (CDR) and the survey was administered electronically on the Survey Monkey platform. A reminder email was sent after two weeks to all those on the email list. An additional request for RDs to complete the survey was also administered via social media through Facebook and LinkedIn.

Survey Content

The survey was a total of 23 questions which included multiple choice and openended questions where respondents were able to expand on their answers in the text box provided. The first nine questions targeted the education, credentials, and experience of the respondents. The following six questions were directed at their specific experience with preterm infants, where their experience was gained, and their opinion on having an RD in the NICU. The last section of the survey asked RDs who work or have worked in the NICU about their training background. In addition, RDs who did not have experience working in the NICU were asked what resources would be beneficial and how that information should most effectively be delivered. See appendix for survey.

Results

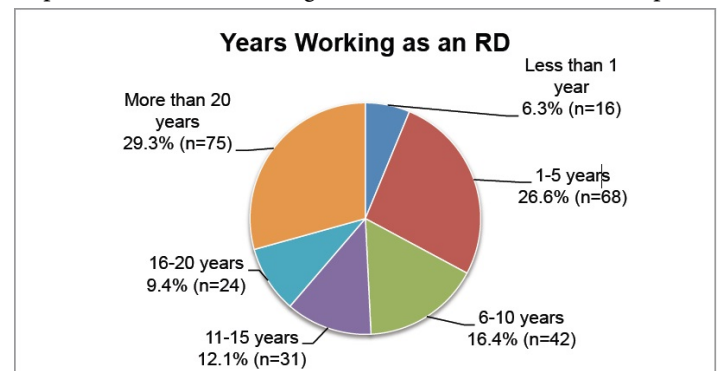
The initial survey response rate was 248 out of 2,500 (10.0 %). After redistributing the survey via Facebook and LinkedIn, the total number of persons that opened the survey increased to 272, although 10 of those opted to not complete the survey. In the end, there were 262 participants that actually participated in the survey.

Various questions throughout the survey were skipped for unknown reasons. Of the 262 participants, there were 256 who provided their highest level of education obtained. According to

the questionnaire, 135 RDs reported having a bachelor's degree (52.7%), 117 reported having a master's degree (45.7%), and 4 reported having their doctorate (1.56%). Based on the 255 RDs that answered "Question 3", nearly one quarter of the participants had additional credentials (23.5%; n=60). The two highest additional credentials were identified as Certified Nutrition Support Clinician (9.0%; n=23) and Certified Diabetes Educator (5.9%; n=15) with only 8 participants (3.14%) identifying that they were Certified Pediatric Nutritionists. Additional answers to "Question 3" on Nutrition-Related Credentials can be found in Table 1.

Nutrition-Related Credentials	Total Respondents	% (n)
Certified Diabetes Educator (CDE)		5.9% (15)
Board Certified Specialist in Gerontological Nutrition (CSG)		1.2% (3)
Board Certified Specialist in Sports Dietetics (CSSD)		0.8% (2)
Board Certified Specialist in Pediatric Nutrition (CSP)		3.1% (8)
Board Certified Specialist in Renal Nutrition (CSR)		1.6% (4)
Board Certified Specialist in Oncology Nutrition (CSO)		2.0% (5)
Certified Nutrition Support Clinician (CNSC)		9.0% (23)
No additional credentials		77.6% (198)

There were 256 RDs that responded to the number of years practicing as an RD. Of those 256, 29.3% have worked with the RD credential for over 20 years (n=75), followed by those who had been an RD between 1 to 5 years (26.6%; n=68). The remainders of responses to "Years Working as an RD" are illustrated in Graph 1.

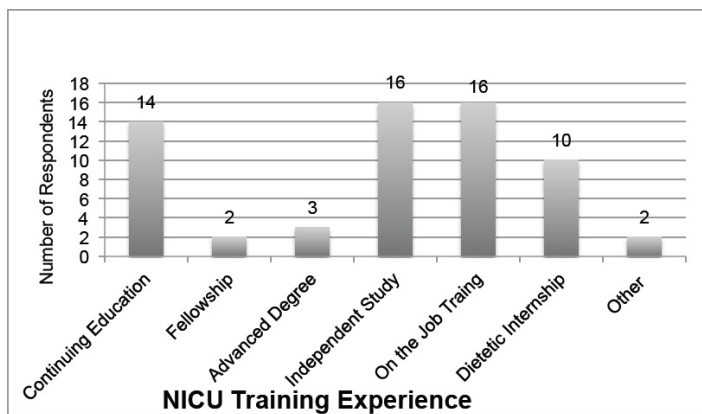


RDs with NICU Experience

Of the 256 participants that answered as to their current working environment, the clinical setting was reported as the most common (57.8%; n=148), although only 50.3% of the clinical RDs (n=75) reported that their hospital has a NICU onsite. The survey then asked if the hospital nearest to them had an onsite NICU with an employed RD. Almost half of the 254 respondents (47.6%; n=121) reported that they did know of an RD working in the NICU nearest to them, 14.2% (n=36) reported there was no RD presence in the closest NICU, and 38.2% (n=97) were unsure. When asked about their experience in the NICU, 28 (11.2%) of the 249 respondents indicated that they are currently working in the NICU, 14.5% (n=36) have previously worked in a NICU, while the majority (74.3%; n=185) reported never having worked in the NICU setting.

Although 36 people said that they had previous NICU experience, only 35 answered as to why they had left that position. The mostly

commonly stated reason for their departure was to work with another population (31.4%; n=11). The RDs that stated that they had NICU experience gave a variety training backgrounds. The majority of NICU RDs indicated that they received their training on the job from fellow RDs and physicians (25.4%; n=16) or through independent study (25.4%; n=16). Fourteen of the RDs (22.2%) who had NICU experience, obtained their training strictly through Continuing Education Units (CEUs) and 10 (n=15.8%) obtained their training during dietetic internships. Additional responses about NICU training experience are illustrated in Graph 2.



Of the 63 RDs with current and past NICU experience, the majority reported their NICU as a Level III (33.3%; n=21) or Level IIIC (22.2%; n=14), offering the highest level of infant care. The two main roles reported by the dietitians with a NICU background were to assess the nutrition status of the patients (95.2%; n=60) and to assist physicians on rounds (65.1%; n=41). The ratio of infants to RDs was most commonly less than 25 infants to 1 RD (52.4%; n=33) yet 9 participants reported a ratio of greater than 75:1 (14.3%). When asked what additional resources enhance their nutritional care for preterm infants, NICU RDs reported additional RDs on staff (60.3%; n=38) and tools for more accurate anthropometric measurements such as a BodPod or DEXA scan (49.2%; n=31). Table 2 shows responses gathered regarding beneficial additional NICU resources.

Additional NICU Onsite Resources Total Respondents	% (n)
Additional staff (RDs, diet techs)	60.3% (38)
Tools for measuring metabolic rate (BodPod, DEXA, etc.)	49.2% (31)
EMRs	15.9% (10)
Other	23.8% (15)

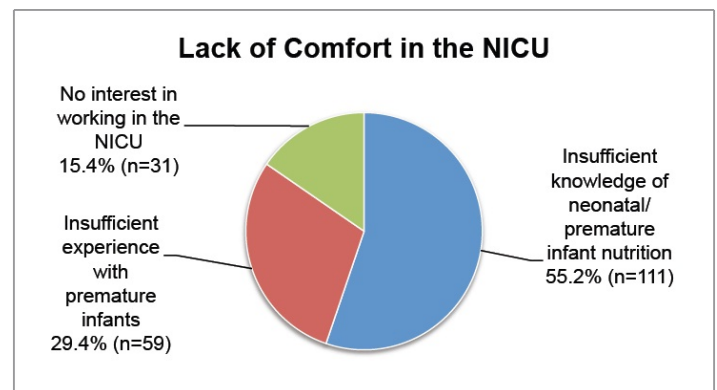
RDs Lacking NICU Experience

More than half of the 254 RDs who completed “Question 9” of the survey stated they lacked experience with premature infants (59.5%; n=151) and of those 254, 30.7% (n=78) reported a lack of experience with pregnant or lactating moms and infants as well.

One hundred three RDs responded to where they had work with premature infants with the majority of RDs (40.6%; n=103)

reporting that their contact time was mainly through the NICU environment (58.3%; n=60), with the WIC Program and internship experience following at 38.8% (n=40) and 20.4% (n=21), respectively. When asked about the importance of NICU RDs, 225 out of the 254 that answered rated the importance of having an RD in the NICU as “very important” (88.6%) while none of the RDs reported the presence of an RD as “not important.” The most common reasons given by the 252 respondents to “Question 12”, as to why an RD in the NICU is important included that RDs have the ability to increase the health status of the infant (92.9%; n=234) and that they can improve long-term health outcomes regarding the infant (90.5%; n=228).

When asked to rate themselves from 1 to 5 on their knowledge of an RDs role in the NICU, with 5 being very knowledgeable, 168 out of 252 (66.7%) reported 3 or less and subsequently rated their comfort level working in the NICU as very low, with 43.7% (n=110) stating a comfort level of 1. Over half of the 201 respondents giving the reason that they feel uncomfortable in the NICU, 111 (55.2%) indicated that it was due to insufficient knowledge of neonatal and premature infant nutrition with the additional responses shown in Graph 3



On the same type of rating scale mentioned above, 5 being “very interested”, 165 of the 249 responding RDs (66.3%) reported that they would have been very interested and would have liked a NICU rotation in their dietetics internship to increase their education with this population. In order to gain neonatal nutrition knowledge to increase their comfort level with working in the NICU setting, the most common response of the 183 respondents was that CEUs would be the best medium to communicate the knowledge necessary to work in this environment (79.2%; n=145). The remaining answers regarding Additional NICU Training Resources are listed in Table 3.

Additional NICU Training Resources Total Respondents	% (n)
Continuing Education Credits (CEU)	79.2% (145)
Fellowship	40.4% (74)
Advanced Degree	31.2% (57)
Independent Study	42.6% (78)
Other	11.5% (21)

Discussion

The aim of this study was to determine and assess the reasons behind the lack of RD presence in the NICU and what would be the best way to reach out to current RDs, dietetic interns, and dietetic students about increasing their participation and knowledge on neonatal nutritional care. Premature infants are at an extremely high risk for nutrient deficiencies and suboptimal growth, which may greatly impact their future health and neurologic development [9]. By having an RD on a multidisciplinary team in the NICU, preterm infants have a greater chance of achieving catch-up growth and therefore avoiding the development of numerous lifelong complications such as inadequate lung development, GI complications, and poor neurological development [10]. It is estimated that 15% of preterm infants will develop cerebral palsy and 50% will develop some sort of cognitive abnormality with a direct link to LBW [11]. Evidence has also shown that excessive growth by catch-up of preterm infants may be associated with an increased risk of developing obesity and cardiovascular disease later in life, which can be prevented by providing adequate energy and high protein to promote lean body mass [12-14].

With the nutrition care and support that can be provided by a trained NICU RD, these circumstances that can result in lifelong effects can be reduced. A knowledgeable RD can help to determine the nutritional needs of the infants as well as monitor their growth, keeping growth on track and making corrections if needed. Since few NICUs employ an RD to assist with the nutritional status of this vulnerable population, providing optimal nutritional care to premature infants has become a prevalent issue [15]. This study was designed to further explore the barriers to which current RDs in practice are experiencing within their own NICUs or what prevents them from working in the NICU setting.

Historically, almost 50% of all RD's working in NICUs held a master's degree or higher [7]. Our study indicates similar statistics with 121 of the 256 responding RDs (47.3%) that participated in our study also reported holding a master's degree or higher. Given the accurate representation of experienced RDs that participated in this study, we were able to assure that the information provided was valid and thorough enough to provide relevant feedback regarding this issue. The majority of participants reported that an RD present in the NICU is either "very important" or "important" (98.4%; n=250). This supports the need for this study and validates the need to determine what is preventing RD from practicing in NICUs and how to best address this situation to increase interest and employment in this area of dietetics.

Conclusion

The findings of this study suggest that the most common barrier RDs have with practicing neonatal nutrition is their lack of knowledge of premature infant care. We believe that this lack of knowledge is correlated to their evident lack of comfort in the NICU setting, since 110 out of the 252 respondents (43.7%) indicated a "1" which was the lowest level of NICU comfort on a scale from 1 to 5.

We acknowledge the limitations of our study including RDs who were not employed in the NICU not taking the survey because they felt as though it did not apply to them, skipped questions, potentially missing a population of RDs who do not use email or social media, and participants without an RD credential possibly taking our survey.

Despite these limitations, our results show that the best avenue to reach out to RDs to increase their NICU participation is through the use of developing CEUs on neonatal nutritional care. It is therefore critical that current NICU RDs be instrumental in creating CEU opportunities for students and RDs who are not specialized in a specific area of dietetics. In addition, it is imperative that dietetic students are exposed to and educated on the importance of NICU nutrition in undergraduate education as well as during their dietetic internship. In order for outcomes of premature infants to improve, their needs to be an increase in nutritional care on a national level by trained RDs.

References

1. Prince A, Groh-Wargo S (2013) Nutrition management for the promotion of growth in very low birth weight premature infants. *Nutr Clin Pract* 28: 659-668.
2. Steward DK (2012) Growth Outcomes of Preterm Infants in the neonatal Intensive Care Unit: Long-term Considerations. *Newborn and Infant Nursing Reviews* 12: 214-220.
3. Ehrenkranz RA, Younes N, Lemons JA, Fanaroff AA, Donovan EF, et al. (1999) Longitudinal growth of hospitalized very low birth weight infants. *Pediatrics* 104: 280-289.
4. Miller M, Vaidya R, Rastogi D, Bhutada A, Rastogi S (2014) From parenteral to enteral nutrition: a nutrition-based approach for evaluating postnatal growth failure in preterm infants. *JPEN J Parenter Enteral Nutr* 38: 489-497.
5. Boersma B, Wit JM (1997) Catch-up growth. *Endocr Rev* 18: 646-661.
6. McLeod G, Sherriff J (2007) Preventing postnatal growth failure--the significance of feeding when the preterm infant is clinically stable. *Early Hum Dev* 83: 659-665.
7. Ohio Neonatal Nutritionists (1990) Nutrition services in neonatal intensive care: A National survey. Obtained from: Groh-Wargo S, Thompson M, Hovasi- Cox J. *Nutritional Care for High-Risk Newborns (3rd edn)*. Chicago, IL: Precept Press Inc 2000.
8. Sneve J, Kattelmann K, Cuirong R, Stevens DC (2008) Implementation of a Multidisciplinary Team That Includes a Registered Dietitian in a Neonatal Intensive Care Unit Improved Nutrition Outcomes. *Nutrition in Clinical Practice* 23: 630-634.
9. Arsenaault D, Brenn M, Kim S, Gura K, Compher C, et al. (2012) A.S.P.E.N. Clinical Guidelines: hyperglycemia and hypoglycemia in the neonate receiving parenteral nutrition. *JPEN J Parenter Enteral Nutr* 36: 81-95.
10. Bryson SR, Theriot L, Ryan NJ, Pope J, Tolman N, et al. (1997) Primary follow-up care in a multidisciplinary setting enhances catch-up growth of very-low-birth-weight infants. *J Am Diet Assoc* 97: 386-390.

-
11. Herrmann KR, Herrmann KR (2010) Early parenteral nutrition and successful postnatal growth of premature infants. *Nutr Clin Pract* 25: 69-75.
 12. Olsen IE, Richardson DK, Schmid CH, Ausman LM, Dwyer JT (2005) Dietitian involvement in the neonatal intensive care unit: more is better. *J Am Diet Assoc* 105: 1224-1230.
 13. Roggero P, Giannè ML, Amato O, Orsi A, Piemontese P, et al. (2009) Is term newborn body composition being achieved postnatally in preterm infants? *Early Hum Dev* 85: 349-352.
 14. Uthaya S, Thomas EL, Hamilton G, Doré CJ, Bell J, et al. (2005) Altered adiposity after extremely preterm birth. *Pediatr Res* 57: 211-215.
 15. Vohr BR, Wright LL, Dusick AM, Mele L, Verter J, et al. (2000) Neurodevelopmental and functional outcomes of extremely low birth weight infants in the national institute of child health and human development neonatal research network, 1993-1994. *Pediatrics* 105: 1216-1226.

Copyright: ©2017 Theresa Loomis RD. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.