

# The Experiences and Perceptions of Neonatal Clinicians When Using a Responsive Bassinet

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## ABSTRACT

**Background:** Innovative technologies, such as the SNOO Smart Sleeper responsive bassinet (SNOO), may offer support to neonatal clinicians in their work environment.

**Purpose:** The objectives of this study were to describe the experiences of clinicians when using the SNOO in their clinical settings, including their perceptions of the SNOO on the quality of infant care and their work environment.

**Methods:** A retrospective, secondary analysis was conducted using 2021 survey data across 44 hospitals participating in the SNOO donation program. Respondents included 204 clinicians, predominantly neonatal nurses.

**Results:** The SNOO was used in a variety of clinical scenarios, including with fussy, preterm, and healthy full-term infants, as well as substance-exposed infants experiencing withdrawal. The SNOO was perceived as a driver of positive infant and parent experiences, including enhanced quality of care. Respondents perceived the SNOO as providing them with support in their daily caring for newborns, reducing their stress, and helping them in lieu of hospital volunteers. Clinicians reported an average time savings of 2.2 hours per shift.

**Implications for Practice and Research:** Results from this study provide evidence for future evaluation of the SNOO as a technology for hospitals to adopt to improve neonatal clinician satisfaction and retention, as well as improve the quality of patient care and parental satisfaction.

**Key Words:** innovative technology, neonatal intensive care, nurse burnout, nurse engagement, responsive bassinet

Neonatal clinicians work in a highly specialized environment caring for preterm and acute or chronically ill infants with conditions that threaten their quality of life and mortality. Practicing

in the neonatal intensive care unit (NICU) can be emotionally charged due to highly stressful and demanding clinical situations that often encompass life or death moments.<sup>1</sup> The delivery of quality care in the NICU necessitates educated clinicians with specialized intensive care training. Not only does the role of neonatal clinicians involve making life or death decisions, but it also includes navigating and completing an abundance of tasks with varying degrees of priority,<sup>2</sup> as well as providing a high level of support and education to parents who frequently experience stress, grief, and anxiety during their NICU journey.<sup>3</sup>

The adoption of innovative technologies may present an opportunity to support neonatal clinicians in their work environment. Well-designed, intuitive products that promote clinician engagement and create a healthier work environment have the potential to improve job satisfaction, productivity, retention, and patient care quality.<sup>4</sup> Several studies have focused on improving efficiency and quality of care when using electronic health-care records.<sup>5-7</sup> Some studies have explored the use of video technologies, including webcams, to improve parent communication with NICU clinicians, and address parent/infant separation.<sup>8-10</sup> Few studies have explored the efficacy of innovative devices in improving care for infants in the NICU.<sup>11-13</sup> There is a dearth of literature on the experiences of clinicians when using innovative devices in neonatal care environments.

A technological innovation that should be explored is the SNOO Smart Sleeper (SNOO). The SNOO is a

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Exempt status was provided by the Institutional Review Board of The College of New Jersey prior to conducting the secondary analysis. Written informed consent was not obtained. Consent was assumed by respondents freely entering the digital survey upon receiving an invitation to participate. Only de-identified data were provided to the principal investigator for the retrospective secondary analysis.

The authors declare no conflicts of interest.

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responsive bassinet for infants from approximately 34 weeks of gestational age to 6 months (corrected age) (Figure 1). The SNOO provides continuous womb-like sensations, including gentle, rhythmic rocking and white noise to reduce fussing and improve an infant's sleep. The infant is placed in a specially designed sleep sack, which is a cotton swaddle with wings on either side that attach to safety clips to secure the infant on the back (Figure 2) and to prevent rolling to an unsafe position. When the sensors detect crying, SNOO's embedded computer and algorithm guide the bed through a series of 4 incrementally higher levels of motion (ie, faster, shorter amplitude) and sound (ie, higher volume and pitch), which are modeled on the typical calming sequence used by experienced caregivers. If the infant calms, the SNOO gradually returns to the baseline level. If crying persists for more than 3 minutes, the bed automatically turns off. The 5 S's (swaddling, side/stomach position, shushing, swinging, and sucking), an evidence-based approach used to evoke a calming response in infants, was used to inform the conceptual design of the SNOO.<sup>14</sup> The SNOO, when compared to parental soothing, was found to be equally as effective at producing a calming response in infants.<sup>15</sup> The SNOO has also been shown to support the Eat, Sleep, Console care model for infants with neonatal abstinence syndrome (NAS).<sup>16</sup> Aggregated consumer sleep log data from more than 114,000 users showed the SNOO was associated with an average of 1-hour additional nighttime sleep for infants from birth through the first 6 months of life relative to normative infant sleep.<sup>17</sup> Data have also shown that infants in the SNOO average one less waking per night when compared with the normative infant sleep ( $1.09 \pm 0.89$  vs  $1.89 \pm 1.10$ ).<sup>18</sup>

The potential benefits to clinicians when using a responsive bassinet, such as the SNOO, have not



previously been reported in the literature. The development and adoption of innovative technologies has been hampered by inadequate investment in addressing the key concerns of the clinicians tasked with using them.<sup>19</sup> There are also challenges related to identifying which technologies provide a benefit to patients while also meeting the demands of modern healthcare systems.<sup>20</sup> The purpose of this study was to describe the experiences and perceptions of NICU clinicians when using the SNOO in their clinical settings during the COVID-19 pandemic, and their perceptions of the SNOO on the quality of infant care and their work environment.

### What This Study Adds

- Clinicians who used the SNOO reported having support in their work environment.
- The SNOO generated on average 2.2 hours per shift of time savings for each clinician.
- Clinicians perceived the SNOO as improving patient care quality and safe sleep positioning for infants.

## METHODS

### Design, Study Settings, and Participants

A secondary, retrospective data analysis was conducted using survey data collected from clinicians

using the SNOO in hospital settings. The survey was originally designed and administered by the manufacturer of the SNOO Smart Sleeper, Happiest Baby, Inc (HBI), to measure the impact of their hospital donation program during COVID-19. A convenience sample of the 62 hospitals that received a donation of a SNOO were used to recruit survey respondents. Survey invitation hyperlinks and QR codes were sent between August 26, 2021, and September 15, 2021, via email to clinical champions at all 62 partner hospitals who then disseminated the survey via email to care team members. Up to 3 reminder emails were sent to each hospital champion. The survey was administered using SurveyMonkey, an online, digital survey software platform. An initial qualifying question was used to determine whether respondents were eligible to complete the survey. To be eligible, respondents had to report they had used the SNOO in their clinical setting. If respondents answered they had not used the SNOO, then they were not asked to complete additional survey questions.

### Measures

A 17-question survey, developed by HBI, was disseminated to obtain feedback from clinical care team members at partner hospitals (see Supplemental Digital Content 1, available at: <http://links.lww.com/ANC/A215>). The aim of the survey was to examine both experiential and operational outcomes of clinicians using the SNOO. Two questions explored respondent characteristics (role, tenure) and 6 focused on the utilization of the SNOO. Two questions included 4-point Likert agreement scales with 13 categories related to clinician experiences centered around infant care and work environment. Three questions explored SNOO resource utilization. Two open-ended questions were included to allow respondents to provide more information about their likes and dislikes related to the SNOO. One question used a 11-point Likert scale to determine how likely respondents would be to recommend the SNOO to a colleague in their clinical setting and 1 question asked respondents who chose not to use the bassinet to identify their primary reason for that decision.

### Data Analysis

HBI provided the de-identified raw survey data export file to the principal investigator for a secondary analysis of the data. Ethical approval sought from the Institutional Review Board of The College of New Jersey granted an exempt status prior to conducting the secondary analysis. Respondents who were SNOO users and who completed the 2021 Happiest Baby Clinician Survey were eligible for inclusion in the data analysis; participants who were not SNOO users or who did not complete the survey

questions were excluded. Descriptive statistics to quantify and summarize responses to each question in the survey using frequency and response distributions were conducted in Microsoft Excel. The responses to the open-ended questions will be reported in a separate publication.

## RESULTS

### Demographics

A total of 204 clinicians from 44 hospitals responded to the survey. The survey completion rate was 91%. The organizational response rate was 71%. On average, approximately 5 clinicians responded from each hospital (mean = 4.5; range 1-40). Respondents from hospitals located in 22 states were included in the analysis. In terms of respondent roles, 181 were nurses (87%), 7 were physicians (3%), 4 were advanced practice providers (2%) (advanced practice registered nurse [RN], nurse practitioner, certified RN anesthetist, etc), 3 were lactation specialists (1%), and 12 (6%) reported their role as "other" (including, child life specialists, a unit director, unit assistant, and a process improvement specialist). Nearly half of the clinicians (n = 94; 47%) reported a tenure of 10 or more years and 21% (n = 43) reported working at least 5 years at their hospital. The survey took respondents an average of 4 minutes to complete.

### SNOO and Clinical Utility

Survey respondents reported using the SNOO in a variety of clinical scenarios, but primarily in NICU settings: Level IV (n = 76; 32%), Level III (n = 59; 25%), Level II (n = 44; 19%), and Level 1 Nurseries (n = 30; 13%). The SNOO was also used in infant/mother rooms (n = 15; 6%), and other pediatric-focused hospital units (n = 11; 5%) (ie, general pediatric units, pediatric intensive care units). Respondents indicated using the SNOO with infants experiencing NAS (n = 174; 98%), fussy infants (n = 94; 53%), routine newborns (n = 9; 5%), premature infants (n = 5; 3%), and infants recovering from surgery (n = 4; 2%). Other clinical situations when the SNOO was used (n = 6; 3%) included COVID-19, isolation, infants with neurological deficits, and infants requiring chronic care.

### Clinicians' Perceptions of SNOO

A 4-point Likert agreement scale was used to determine clinicians' perceptions of the SNOO on infant care, parent experience, and clinician/staff experience in their work environment (Table 1). Responses were subsequently grouped into 2 categories: agree ("strongly agree" and "somewhat agree") and disagree ("somewhat disagree" and "strongly disagree"). Regarding infant care, respondents unanimously agreed (n = 172; 100%) with the statement

TABLE 1. Clinician Agreement Responses to SNOO and Infant, Parent, and Clinician Experiences (n = 204)

Based on My Experiences, SNOO ...	n	Yes, a Lot n (%)	Yes, a Little n (%)	No, Not Much n (%)	No, Not at All n (%)
<b>SNOO and infant or parent experiences</b>					
Keeps babies safely on the back	172	153 (89)	19 (11)	0 (0)	0 (0)
Reduces fussing	172	136 (79)	33 (19)	2 (1)	1 (1)
Enhances the quality of infant care	175	136 (78)	37 (21)	1 (1)	1 (1)
Improves the hospital experience for parents	165	105 (64)	47 (28)	11 (7)	2 (1)
Supports parents receiving care during the COVID-19 pandemic	151	67 (44)	51 (34)	19 (13)	14 (9)
Assists in the care of mothers and/or newborns with COVID-19	138	53 (38)	33 (24)	32 (23)	20 (14)
<b>SNOO and clinician experience</b>					
Gives staff extra time to focus on other tasks	174	128 (74)	40 (23)	5 (3)	1 (1)
Helps reduce staff stress	172	116 (67)	49 (28)	6 (3)	1 (1)
Offers staff support in lieu of hospital volunteers (eg, "Cuddler" programs)	154	105 (68)	41 (27)	7 (5)	1 (1)
Reduces strain for clinicians who are coping with staffing shortages	165	88 (53)	53 (32)	15 (9)	9 (5)
Helps staff care for higher acuity patients	169	85 (50)	52 (31)	26 (15)	6 (4)

"SNOO keeps babies safely on the backs," 99% (n = 173) agreed with the statement "SNOO enhances the quality of infant care," and 98% (n = 169) agreed with the statement "SNOO reduces fussing." The SNOO was also perceived by clinicians to be a driver of positive parent and infant experience: 92% agreed with the statement "SNOO improves the hospital experience for parents" (n = 152) and 78% agreed with the statement "SNOO supports parents receiving care during the COVID-19 pandemic" (n = 118). Additionally, 78% of participants agreed with the statement "SNOO assists in the care of mothers and/or infants with COVID-19." Almost all respondents agreed with the statements "SNOO gives staff extra time to focus on other tasks" (n = 168; 97%), "SNOO helps reduce staff stress" (n = 141; 96%), and "SNOO offers staff support in lieu of hospital volunteers" (n = 146; 95%).

The survey included a standard Net Promoter Score (NPS) prompt, based on an 11-point Likert scale (0 = not at all likely, 10 = extremely likely). Using the standard NPS methodology of asking the question, "How likely would you be to recommend SNOO to a colleague to use in their hospital?" the reported data were categorized into 3 groups: detractors (those rating the bassinet 0-6), neutrals (those rating it 7 or 8), and promoters (those rating the bassinet 9 or 10). Detractors represent individuals not happy with the product, neutrals represent those who are satisfied with it, but not enthusiastic, and promoters are those who are enthusiastically supportive. In this study, 8% of respondents were

detractors (n = 14), 32% were neutral (n = 39), and 70% were promoters (n = 122). The NPS, calculated by subtracting the percentage of detractors from the percentage of promoters, was 62%.

### SNOO and Time Savings

Survey respondents were asked "How much time does SNOO save you each shift by soothing fussy infants" to determine whether clinicians perceived the SNOO as providing time savings during their shift. Respondents could choose, "The SNOO does not save me time" or they could select a range of times beginning with "fewer than 15 minutes" to "more than 5 hours." Only 3% (n = 5) of the respondents selected the SNOO does not save them time. Two percent (n = 4) reported the SNOO saved them fewer than 15 minutes, 5% (n = 9) reported 15 to 30 minutes, 17% (n = 29) 30 minutes to 1 hour, 26% (n = 44) reported 1 to 2 hours, 19% (n = 33) 2 to 3 hours, 14% (n = 24) 3 to 4 hours, 7% (n = 12) 4 to 5 hours, and 7% (n = 12) more than 5 hours. To calculate the mean time savings, the midpoint between each interval was identified (ie, 1-2 hours = 1.5 hours) and the data were grouped into these intervals (Table 2). Next, the midpoints were multiplied by the frequencies of the corresponding intervals and the sum of the products was divided by the total number of values to calculate mean time savings per shift. On average, clinicians reported a time savings of 2.2 hours per shift per nurse and 28% reported saving 3 or more hours per shift (Figure 3).

**TABLE 2. Reported Times Savings With Midpoint Interval (n = 172)**

How Much time does SNOO Save You Each Shift by Soothing Fussy Infants?	Interval Midpoint, min	n (%)
The SNOO does not save me time	0	5 (3)
<15 min	7.5	4 (2)
15-min	22.5	9 (5)
30 min to 1 h	45	29 (17)
1-2 h	90	44 (26)
2-3 h	150	33 (19)
3-4 h	210	24 (14)
4-5 h	270	12 (7)
>5 h	300	12 (7)
<b>Total</b>	<b>Average: 129.8</b>	<b>172 (100)</b>

**DISCUSSION**

**SNOO: Characteristics of Users**

This study explored the use of a robotic, responsive bassinet by neonatal clinicians. Most (87%) of the respondents were nurses (n = 181), and more than half (57%) reported working in high-acuity NICU settings (Level III or IV NICUs). Two-thirds of the sample (68%) were experienced neonatal clinicians with 5 or more years’ tenure at their hospitals.

**SNOO: Clinicians’ Perceptions of Positive Infant and Parent Experiences**

Clinicians in this study perceived the SNOO as promoting a positive infant and parent experience. Prior studies confirm that parenting an infant in the NICU is associated with high levels of stress, grief, fear, and anxiety, which intensified for parents during the pandemic.<sup>3</sup> A recent study reported that, during COVID-19, some parents of NICU infants felt

alienated from decision-making and they sensed various challenges in the unit, such as staffing shortages and staff turnover.<sup>21</sup> The clinicians in this study perceived the SNOO as improving the hospital experience for parents, supporting parents receiving care during the pandemic, and assisting in the care of the mothers and/or infants with COVID-19.

Almost all clinicians (99%) in this study agreed the SNOO enhanced the quality of infant care and 98% (n = 169) agreed the SNOO reduced infant fussing. Prior research has reported that the SNOO is equally as effective at soothing infants as parents.<sup>15</sup> Respondents in this study also agreed the SNOO helped nurses adhere to, and model, safe sleep recommendations. The American Academy of Pediatrics recommends infants be positioned supine when sleeping, which has been shown to decrease the incidence of sudden infant death syndrome.<sup>22</sup> It is also recommended that safe home sleep practices are used in the NICU when there are no medical contraindications and that safe sleep is modeled for parents,<sup>23</sup> yet many NICUs do not adhere to safe sleep recommendations.<sup>24,25</sup> Preintervention data gathered from a Level IV NICU for a recent quality improvement study showed that 87% of infants were in an unsafe sleep environment.<sup>24</sup> All of the clinicians (100%) in this study agreed the SNOO kept infants positioned on their backs.

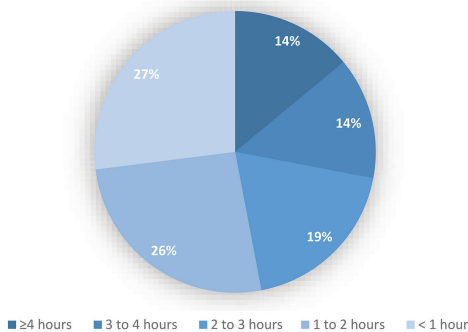
**SNOO: Clinical Utility**

Although clinicians reported using the SNOO across a variety of clinical situations, it was most used with infants experiencing NAS (98%). Substance-exposed infants experience a broad array of symptoms, including high-pitched crying, irritability, sleep problems, feeding issues, tight muscle tone, seizures, and trembling.<sup>26</sup> A recent study reported that the SNOO is supportive of the Eat, Sleep, Console care model for infants with NAS.<sup>16</sup> Previous research has established that caring for infants with NAS is complex and requires clinical expertise, as well as an organizational structure that allocates sufficient resources (eg, a lower patient-to-nurse ratio). Nurses report experiencing high levels of distress when assigned to infants with NAS due to trying to control these persistent symptoms and the time it takes to comfort and soothe the infant.<sup>27,28</sup> When nurses are unable to spend time directly soothing or comforting an infant with NAS, withdrawal symptoms escalate. In turn, nurses experience more distress during their shift. Nurses report that it is often difficult to find the time to provide comforting or soothing measures due to having to tend to tasks that are considered higher priority for their other patients.<sup>28</sup>

**SNOO: Innovative Technology to Enhance Clinicians’ Work Environment**

Staffing shortages and burnout, especially among nurses, were evident prior to the pandemic, but these issues have significantly worsened since COVID-19.

**FIGURE 3**



Time savings reported by SNOO users.

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Inadequate staffing and suboptimal work conditions have been associated with poorer outcomes for neonates.<sup>29</sup> In a survey of 288 maternal and neonatal clinicians conducted during the pandemic, as many as 66% of respondents reported burnout and only 34% reported that strategies in the workplace were sufficient to reduce burnout.<sup>30</sup> As many as 59% of nurses reported difficulty focusing on their work.<sup>30</sup> Almost one-third of RNs report that they plan to leave bedside nursing.<sup>31</sup> The mass exodus of nurses from the bedside has been described as “*The Great Resignation*.”<sup>32</sup> Workload, staffing challenges, and work environment are among the top 10 reasons why nurses are resigning from their jobs.<sup>33</sup> Contrary to those macro-trends, clinicians in this study reported that the SNOO improved their work environment. Survey respondents agreed the SNOO supported them in their daily work of caring for newborns by giving extra time to focus on other tasks and reducing stress. Clinicians perceived the SNOO as providing them with support in lieu of hospital volunteers when infant cuddler programs were suspended during the COVID-19 pandemic, which was consistent to findings from a prior study.<sup>16</sup>

Embracing the use of novel technologies has the potential to change the way healthcare is delivered.<sup>20</sup> Innovative strategies to deliver patient care may maximize how neonatal clinicians spend their time and energy in their work environments and allow them to focus their efforts on those patients and tasks that need their expertise the most. When nurses are supported in their work environments, they are less likely to experience burnout or resign from their role.<sup>31</sup> Almost all the clinicians in this study (99%) agreed that the SNOO demonstrated their hospital’s commitment to trialing innovative technologies. Most clinicians (92%) reported they would recommend the SNOO to their colleagues (a response of  $\geq 7$  on a 10-point Likert scale), showing they valued having access to the SNOO on their units. The clinicians in this study reported an NPS of 62% demonstrating overall positive clinician experience with the SNOO. According to Reichheld,<sup>34</sup> the creator of the NPS, the median NPS of more than 400 companies representing 28 industries is 16%, which is based on about 130,000 customer survey responses.

### **SNOO: Time Savings and Implications for Nurses and Hospitals**

For neonatal clinicians, time is of the essence due to the varying demands encountered throughout the duration of their shift. The SNOO resulted in an average self-reported time savings of 2.2 hours per shift per respondent. For nurses, time savings is experienced as reduced work stress.<sup>35</sup> For organizations, time savings can lead to greater efficiency, improved morale, and monetary savings.<sup>35</sup> Specifically, neonatal nurses complete more than 100

discrete tasks per shift.<sup>2</sup> Given the current staffing shortages, neonatal nurses are likely completing an even higher number of tasks per shift. Nurses are currently burdened with a higher workload, which has been associated with an increase in missed tasks among neonatal nurses.<sup>36,37</sup> A study that included 30 NICUs found the prevalence of missed care to be 40%.<sup>29</sup> Data show that over 10% of neonatal nurses miss activities that involve parents, predominantly parent education.<sup>29</sup> Additionally, an increased infant-to-nurse ratio increases the odds of nurses missing care during their shift.<sup>36</sup> Missed care has been associated with a decrease in job enjoyment and an incremental increase in neonatal nurses intent to leave their units.<sup>38</sup> Factors in the NICU that contribute to missed tasks include frequent interruptions, patient emergencies, and an unanticipated increase in patient volume and/or higher acuity on the unit.<sup>36</sup>

Organizations benefit from ensuring clinicians have the resources they need to be successful and safe in their clinical environments.<sup>39</sup> For neonatal nurses, resources that reduce interruptions may improve patient care and reduce nurse burden and burnout. Staffing shortages, high patient-to-nurse ratios, insufficient supplies or resources, and lack of work environment innovations—all undermine a successful work culture. Organizations must begin to analyze the costs of investing in strategies to enhance work environments versus the costs of nurses leaving their jobs. The average turnover cost for a bedside RN is approximately \$46,100, which results in a hospital losing on average between \$5.2 and \$9.0 million annually. Moreover, each percent change in RN turnover is anticipated to cost or save most hospitals an additional \$262,300 per year.<sup>33</sup>

### **Limitations**

There were several limitations associated with this secondary analysis. The purpose of this descriptive design was to provide a summary of the findings; therefore, cause and effect cannot be established.<sup>40</sup> The use of a convenience sample may have introduced potential bias and reduces generalizability.<sup>41</sup> The responses represent only the participants who were recruited to participate in the study. The survey relied on self-reported clinician responses and assumes respondents will be truthful. Although survey responses were anonymous and no identifiable information was collected, it is possible that respondents were more likely to give socially desirable answers. The data were collected using an unvalidated, self-reported survey instrument. Although the survey was reviewed by a NICU clinician to establish face validity, it was not pilot tested or analyzed for content validity. Future research on the impact of the SNOO should consider incorporating validated testing measures. Nevertheless, the survey offers valuable insights into perceived support among

clinicians during periods of increased stress or workforce disruption during a pandemic.

The survey was conducted during the COVID-19 pandemic and, although nursing stresses and short staffing continue to persist, the survey findings may not be representative of clinician experience under nonpandemic circumstances. The survey was originally conducted by HBI, the manufacturer of the SNOO, to evaluate the impact of its hospital donation program, which could be viewed as a conflict of interest. To decrease this limitation, HBI collaborated with a PhD-prepared researcher with clinical experience in the NICU to independently conduct an institutional review board-approved secondary analysis of the data. The benefit of conducting a secondary analysis is that the data already exist, but limitations to this study method are that the researcher was not involved in the design of the survey questions or data collection procedures.<sup>42</sup>

### Implications and Future Research

The findings of this study show that most neonatal clinicians had a positive experience when using the SNOO in their work settings during the pandemic. Perceived benefits appeared to impact patients, parents, and clinicians. Since this study was conducted during the pandemic when neonatal clinical practice was associated with heightened stressors (limited parent visiting, suspension of volunteer cuddlers, and staffing shortages), a future study should be conducted to confirm the findings. The benefits of the SNOO should be further explored to help inform stakeholders who are charged with determining when they should consider investing in innovative

technologies. Future research should explore the effect of the SNOO on nurse burnout and characterize the time savings features of the SNOO. Because the clinicians in this survey mainly reported using the SNOO to calm and soothe infants in their clinical settings and they valued the safe sleeping benefits of using this device, future research should explore how clinicians perceive the SNOO Smart Sleeper relative to other soothing/calming strategies used in their settings. This study focused on the experience of clinicians, primarily neonatal nurses. Future research should consider exploring the experience of NICU parents to gauge their experience with the SNOO in a hospital setting and to see whether their perceptions of the SNOO in the context of care quality align with clinicians' experiences.

### CONCLUSION

This study suggests that the SNOO has the potential to improve neonatal clinicians' experiences and to reduce some common burdens shouldered by nurses. The SNOO generated time savings, which has implications for mitigating staffing shortages, helping meet the care needs of higher-acuity patients, and possibly allowing nurses to focus on higher priority tasks that might otherwise get missed during their shift. Clinicians perceived the SNOO as improving patient care by increasing quality and safety, with particular emphasis on safe sleep positioning. Clinicians found the SNOO to be helpful in caring for infants across a variety of hospital NICU settings. The SNOO may be a valuable resource to aid with staffing shortages and improve the overall quality of care.

#### Summary of Recommendations for Practice and Research

<b>What we know:</b>	<ul style="list-style-type: none"> <li>• The adoption of innovative technologies may present an opportunity to support neonatal clinicians in their work environment.</li> <li>• Research is limited on the experiences of clinicians when using innovative devices in neonatal care environments.</li> <li>• The SNOO bassinet may provide clinicians with support in neonatal settings, while improving patient quality of care and safety.</li> </ul>
<b>What needs to be studied:</b>	<ul style="list-style-type: none"> <li>• The effect of using the SNOO in neonatal settings on clinician satisfaction and time savings.</li> <li>• Comparison of clinician experience when using the SNOO to other soothing/calming strategies used in neonatal settings.</li> <li>• The experiences of parents in the NICU when using the SNOO to determine whether their perceptions of the SNOO aligns with clinicians' experiences.</li> <li>• Cost analysis of investing in innovative technologies in NICU settings.</li> </ul>
<b>What we can do today:</b>	<ul style="list-style-type: none"> <li>• Consider which innovative technologies may be most impactful at improving patient care and supporting clinicians in neonatal settings.</li> <li>• Ensure nurses have the tools and resources needed to support them in their work environments.</li> <li>• Create an organizational culture of resilience by investing in technologies that improve working conditions for NICU clinicians.</li> </ul>

At a time when the nursing shortage is projected to gravely worsen, there is a substantial need for organizations to consider investing in and adopting innovative technologies that reduce nurse workload and decrease nurse burnout, variables known to drive nurses to leave their jobs and even the profession. Strategies to reduce nurse burnout and improve professional satisfaction have largely focused on improving nurse resilience but gone are the days of placing this additional burden on nurses. More than ever, organizations must recognize their responsibility to cultivate system-wide resilience. Organizational resilience is recognizing unforeseen challenges, pivoting to overcome obstacles when known challenges persist, and ultimately responding to the needs of their patients and workforce.<sup>42</sup> Innovative technologies, such as the SNOO, may improve the work environment of neonatal nurses, generate time savings, and enhance the quality of patient care, which are critical components to overcoming the current challenges faced by neonatal nurses and the healthcare systems that employ them.

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