

NOISE HEALTH HAZARDS TO NEONATE AND HEALTHCARE WORKER

AN EVIDENCE BASED CHANGE PROJECT

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Need for Improved Health Setting

- Promotes staff satisfaction
- Improves patient's outcome.
- Prevent cumulative and irreversible hearing loss of neonate and healthcare workers.
- Controls exposure of neonate and healthcare workers to hazardous noise level.
- Reduces occupational stress.

Noise Pollution

- Dangerous to the underdeveloped sense of hearing of neonates
- Increases oxygen demand in the premature neonates
- Disrupt sleeping pattern of the neonates
- Increases stress and tension in work setting
- Affects job performance of health care workers

Purpose of Improving Health Care Setting

- Meets standards for safety of the neonates and healthcare workers
- Promotes health of both neonates and healthcare workers
- Ensures efficient care
- Reduces re-admission

Introducing Dosimeter

- Standard equipment to monitor noise in the neonatal intensive units
- Enhances awareness of the noise level
- Monitors acceptable level of noise
- Determines the need for engineering and administrative controls

THE PICO QUESTION

- Does the use of Dosimeter as standardized equipment in neonatal intensive care units improve the working environment of the healthcare workers?

PICO

- **Population** - Staff nurses working on the neonatal care units in Central New Jersey who participates in the monitoring of the noise level.
- **Intervention** – The use of Dosimeter as standardized equipment to monitor the noise level in neonatal intensive care units.
- **Comparison** – Compare the use of Dosimeter as standardized equipment versus a non standardized equipment to monitor noise level in neonatal intensive care units.
- **Outcome** – The use of dosimeter as a standardized equipment to monitor the noise level in neonatal intensive care units may improve the healthcare environment as perceived by the staff nurses.

The Review of Literature

- A literature review focusing on using dosimeter was conducted by searching journal articles and the use of the following databases: CINAHL, Pre-CINAHL, MEDLINE, Psychology and Behavioral Sciences Collection, Health Business Full text Elite, Cochrane Database of Systematic Reviews.
- These searches yielded over 30 articles of which 15 were deemed relevant and 10 was used for the review of literature.

Appraisal of Evidence

Level of Evidence	No. of Studies	Quality
Level 1	0	
Level 2	3	Good
Level 3	4	Excellent
Level 4	0	
Level 5	0	
Level 6	2	Excellent
Level 7	1	Excellent

Synthesis of Evidence

- The available evidence supported dosimeter as a standardized equipment to monitor noise level in neonatal intensive care units.
- Evidence indicates that working in a quiet settings prevents tension among workers.
- Dosimeter provides standardized way of monitoring the noise emitted by the equipment.
- Use of dosimeter allows the nurses to work in a setting devoid of unnecessary noise.

Interventions

- Staff education sessions on how to use Dosimeter was provided to all participants.
- The change project was implemented in one of the acute care facility in Central New Jersey in 32 bed neonatal intensive care unit.
- Total of 24 staff nurses participated in this evidence based project.
- A Staff Self Report Questionnaire which was developed by the author was used before and after dosimeter was used.

Demographics

Age	Percent
• Between 31-40	34
• Between 41-50	40
• Between 51-60	26
Gender	
• Female	100
• Male	0
Race	
• African-American	4
• Asian	95
• Caucasian	1
• Native American	0

Demographics con't

Years of Nursing Experience	Percent
• Between 0-5 years	0
• Between 6-10 years	20
• Between 11-15 years	47
• Between 16-20 years	13
• 21 years and over	20

Perceived effectiveness of dosimeter

Pre-dosimeter implementation	Post-dosimeter implementation
25	36
28	44
32	38
32	48
33	40
34	46
30	42

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Pre-dosimeter implementation	Post- dosimeter implementation
35	38
36	40
36	42
38	44
42	46
43	48
47	50
48	50

Comparison

Individual Nurses Perceived Effectiveness of dosimeter	M	N	SD	Low Range	High Range
Pre – dosimeter use	36.24	15	6.38	26	50
Post – dosimeter use	42.86	15	4.78	35	50

Limitations

- The key limitation for this evidence based project was time (total of eight weeks)
- Typically this project should be implemented between 6 months to one year to gather outcome measures on the incidence of medication errors, effectiveness of communication while reporting, impact on job performance.

Implications for practice

Use of dosimeter may:

- Increase awareness and role of healthcare workers to minimize dangerous noise level.
- Ensure neonates and healthcare workers are protected against noise level that doesn't promote wellness.
- Determine and increase the need for administrative and engineering noise management program.

Recommendations

- Volumes of the alarms should be moderate enough to be heard and attend to.
- Conducts audio metric test annually to determine extent of hearing loss.
- Voices (pitch) should be low to minimize noise thus, preventing stress and irritability of personnel.
- Equipment, especially isolettes routinely maintained to minimize noise.
- Telephone ringer changed to red blinking likes to minimize noise.
- Utilize building acoustical consultant to design a good hospital sound environment.

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