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Knowledge Of Staff Nurses On Noninvasive Wearable Devices For Detecting Health Alterations: A Descriptive Cross-Sectional Study

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Abstract: Noninvasive wearable devices are increasingly used in healthcare to detect early alterations in patient health status. Staff nurses, as front-line health professionals, must have adequate knowledge to utilize and interpret data from these devices effectively. To assess the knowledge of staff nurses regarding noninvasive wearable devices used for detecting health alterations. A descriptive cross-sectional study using a structured questionnaire among staff nurses in a tertiary care hospital. Statistical analysis evaluated knowledge levels and their association with sociodemographic variables. The majority of nurses demonstrated moderate knowledge regarding the application, benefits, and limitations of noninvasive wearable devices for health monitoring. Knowledge scores were significantly higher among younger nurses and those who attained higher educational qualifications.

There is a moderate level of awareness among staff nurses regarding noninvasive wearable devices. Regular training and sensitization programs are recommended to bridge knowledge gaps and optimize the use of wearable health technologies in clinical practice.

Index Terms - Noninvasive wearable devices, health alterations, knowledge assessment, staff nurses, health technology, patient monitoring

Introduction

Advancements in wearable technology have revolutionized patient monitoring, providing continuous, non-invasive data about critical health parameters, such as heart rate, blood oxygen saturation, and sleep patterns. The ability to detect early health status changes enhances patient outcomes and informs timely clinical interventions. Nurses, as vital members of the care team, are poised to leverage these technologies in routine practice. However, their effectiveness hinges on the nurses' knowledge and competency in utilizing and interpreting data from wearable devices. Identifying knowledge gaps is crucial for guiding training interventions and driving the effective integration of these technologies in clinical settings.

Materials and Methods

Study Design

This study employed descriptive **cross-sectional design**.

Setting

The research was carried out in a tertiary care multi-specialty hospital.

Participants

A total of **120 staff nurses**, working in various wards and departments, were recruited using stratified random sampling.

Tool

A **structured, validated questionnaire** consisting of 40 multiple-choice questions was used, covering:

- Types of noninvasive wearable devices
- Sensors and parameters detected
- Interpretation of device data
- Benefits and limitations
- Clinical applications

Data Collection

Questionnaires were distributed during staff meetings; responses were collected anonymously to ensure confidentiality.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board. Written informed consent was obtained from all participants.

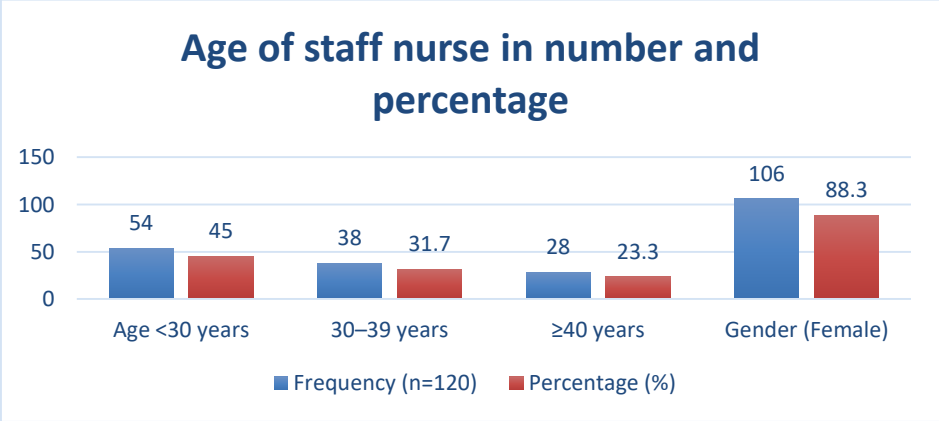
Statistical Methods

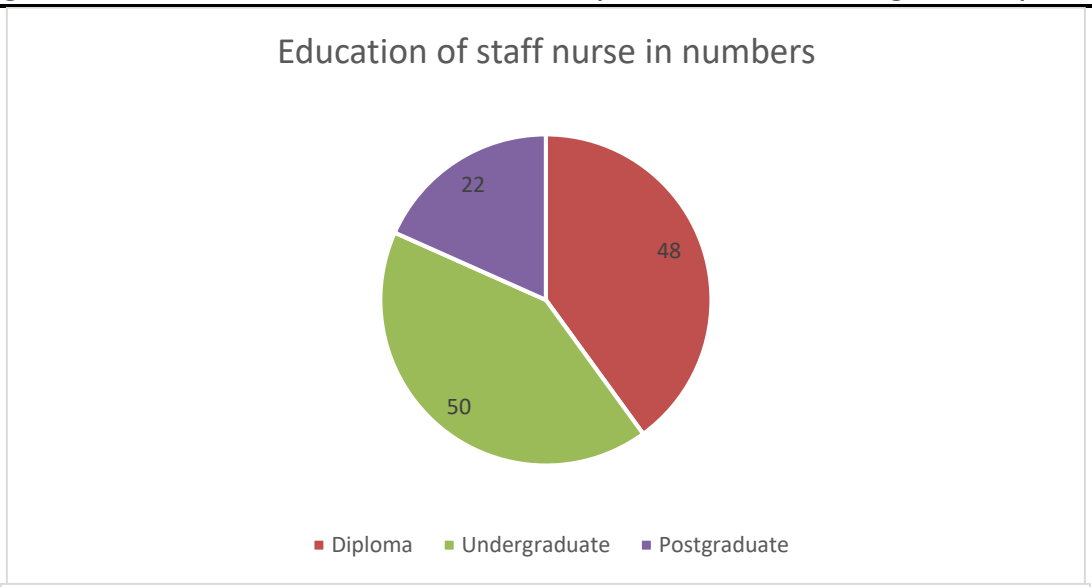
Data was entered into Microsoft Excel and analyzed using SPSS Version 25. Descriptive statistics (mean, standard deviation, frequency, percentage) summarize data. Inferential statistics, including the Chi-square test and ANOVA, were used to assess associations between knowledge scores and variables (age, education, department, and years of experience). A p-value <0.05 was considered statistically significant.

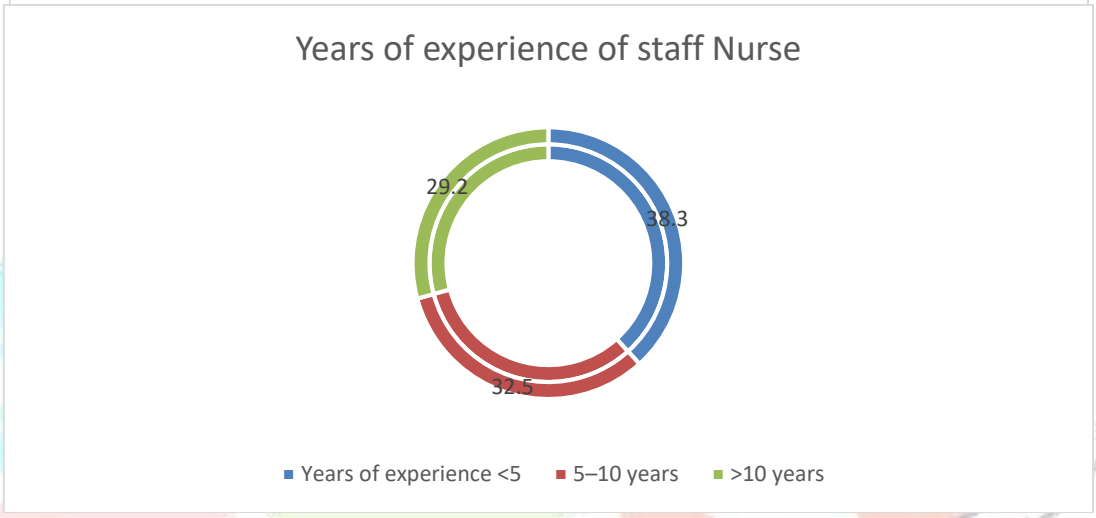
Results

Variable	Frequency (n=120)	Percentage (%)
Age <30 years	54	45.0
30–39 years	38	31.7
≥40 years	28	23.3
Gender (Female)	106	88.3
Education:		
Diploma	48	40.0
Undergraduate	50	41.7
Postgraduate	22	18.3
Years of experience <5	46	38.3
5–10 years	39	32.5
>10 years	35	29.2

Sociodemographic Characteristics



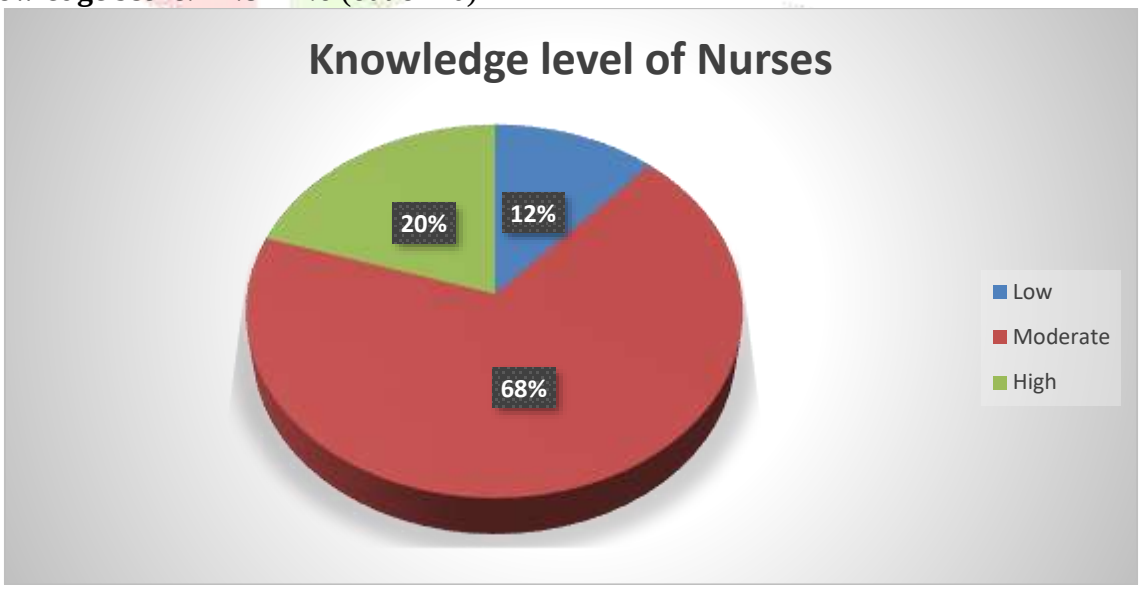




Levels of Knowledge

Knowledge Level	Number of Nurses	Percentage (%)
Low	14	11.7
Moderate	82	68.3
High	24	20.0

Mean knowledge score: 24.8 ± 4.6 (out of 40)

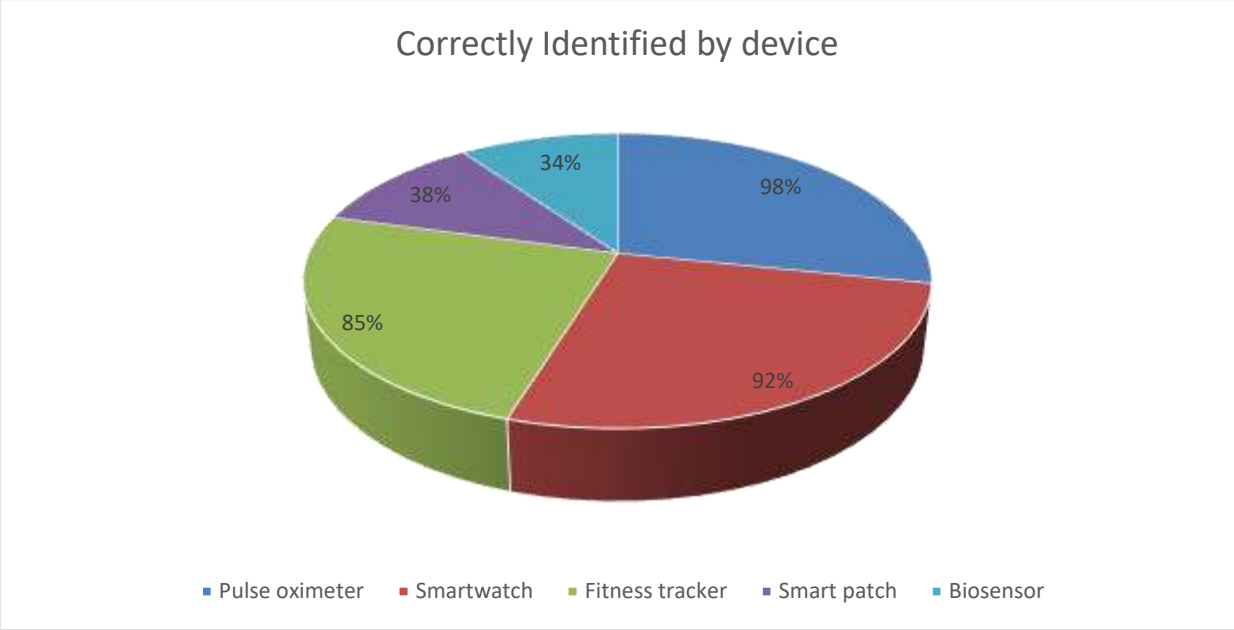


Association Between Knowledge and Sociodemographic Factors

Factor	Mean Score ± SD	p-value
Age <30 years	27.1 ± 3.8	0.02
Age ≥30 years	22.6 ± 3.7	
Postgraduate degree	28.4 ± 3.5	0.03
Diploma/Undergraduate	23.7 ± 4.8	
Attended training	26.9 ± 4.2	0.01
No training	22.8 ± 4.8	

Knowledge by Device Type

Device	Correctly Identified (%)
Pulse oximeter	98
Smartwatch	92
Fitness tracker	85
Smart patch	38
Biosensor	34



Discussion

This study shows that most staff nurses have moderate knowledge regarding non-invasive wearable devices. These findings align with similar studies internationally and within India, indicating that while knowledge of common devices (pulse oximeters, smartwatches) is high, awareness of advanced technologies remains limited. Higher education and training attendance are associated with significantly better knowledge, consistent with literature suggesting professional development will be a driver for technology integration.

The observed knowledge gap regarding advanced devices such as smart patches or biosensors highlights the importance of targeted continuing education. Investing in device-specific workshops and regular practical demonstrations may enhance technology adoption and patient care quality.

Limitations: This research was conducted in a single center and relied on self-reported data, which may introduce bias. Future multi-institutional studies and direct observational assessments are needed to confirm these findings and generalize outcomes.

Conclusion

Staff nurses in this tertiary care hospital possess a moderate level of knowledge about noninvasive wearable devices, with younger and better-educated nurses displaying greater proficiency. Regular, structured training and awareness programs are recommended to optimize the adoption and clinical integration of wearable technology, ultimately improving patient care.

References

1. Sathyanarayana, S., Gururaj, G., et al. (2023). Wearable devices in healthcare: Knowledge and Attitude among Health Professionals. Journal of Nursing Research, 31(2), 134-139.
2. O'Donoghue, J., & Herbert, J. (2012). Data management within mHealth environments: patient sensors, mobile devices, and databases. J Data Inf Qual, 4(1), 1-20.
3. Patel, S., Park, H., Bonato, P., Chan, L., & Rodgers, M. (2012). A review of wearable sensors and systems with application in rehabilitation. Journal of NeuroEngineering and Rehabilitation, 9, 21.
4. Chiauzzi, E., Rodarte, C., & DasMahapatra, P. (2015). Patient-centered activity monitoring in the self-management of chronic health conditions. BMC Medicine, 13, 77.
5. Buche, A. D., & Suresh, H. (2020). Awareness of nurses regarding wearable health monitoring devices. International Journal of Nursing Sciences, 7(1), 45-50.