

# Evaluation of Assessment Data Collected by Nursing Staff and Assistive Personnel in a Simulation Environment

Melissa Freeman<sup>1,\*</sup> and Dr. Pao-Feng Tsai<sup>2</sup>

<sup>1</sup> Undergraduate Student, College of Nursing, Auburn University

<sup>2</sup> Associate Dean for Research, College of Nursing, Auburn University

A complete vital sign assessment includes the measurement of blood pressure, temperature, heart rate, respiratory rate (RR), and oxygen saturation. Vital sign assessment is one of the foundational skills taught in nursing programs in the United States. Obtaining accurate RR data and implementing clinical protocols for intervention requires knowledge, clinical experience, and nursing judgment.

Licensed nurses complete training and clinical practicum hours then sit for state board exams to ensure competency before they can practice nursing. Unlicensed assistive personnel (UAP) are not required to complete such training and are often trained on the job, with no state regulation of competency[1].

Automated technology used currently in clinics and hospitals provides accurate and timely measurements for all except the RR and temperature. UAP delegated the task of collecting and documenting vital signs, including RR data potentially lack the education and clinical judgment necessary to recognize abnormal findings.

The purposes of this pilot study were to determine: if collected, is RR data accurate; if data collected by licensed nursing staff have a higher accuracy rate than data collected by UAP; and if a correlation exists between attitude and accuracy of RR data.

Participants included three licensed registered nurses (RN) and three UAP, one being a current nursing student employed in a UAP capacity at a local hospital. Utilizing the simulation lab at the Auburn University College of Nursing, four high-fidelity mannequins were programmed with vital sign control data. High-fidelity

mannequins allow data to be controlled and simulate human patients as chest rise and fall can be observed, heartbeat and respirations can be auscultated, and pulse points can be palpated.

The two-part study began by instructing participants to assess each mannequin as they would in their employed clinical setting. Research staff, positioned behind two-way glass in the control booth, observed participants' assessment technique and time in seconds that the RR was assessed.

Part two utilized the V-Scale to assess participants' knowledge of, and attitude toward, vital sign collection. This scale consists of sixteen items, scored by a five-point Likert rating scale. It consists of the following subscales: key indicators, knowledge, communication, workload, and technology[2]. Four of the sixteen questions were analyzed for this study as they utilize the psychometric testing of the V Scale to examine participants' knowledge of and attitude specifically toward the RR measurement in clinical settings.

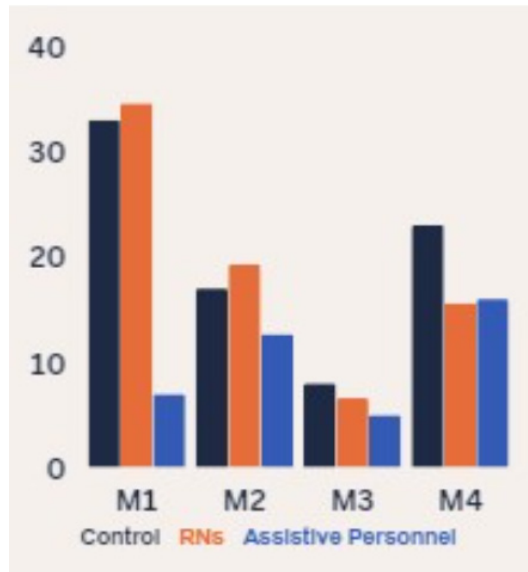
The four questions analyzed included two from each of the knowledge and workload subscales. The responses were recorded as positive or negative based on the Likert scale rating of each participant. If a score of 1-3 was chosen, a negative response was recorded and for scores of 4 & 5, a positive response was recorded.

Findings of part one, illustrated in Fig. 1, show that when RR data is assessed, the RN group has a higher accuracy rate than the UAP group. Using the control as the mean RR data of the RN group achieved higher accuracy than the UAP group across three of the four

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\* Corresponding author: freemmf@auburn.edu

simulators. The control data refers to the vital sign data pre-programmed to each mannequin (M). Research staff could then compare the control data to the RR data recorded by participants. If no RR was assessed, a rate of zero was assigned. This is evident in the M1 results, as only one UAP provided data for RR assessment. In M4, one RN assessed for 15 seconds but failed to multiply by 4 to obtain the 60 second rate, altering the mean.



**Fig. 1.** Mean of participant groups compared to control data.

Findings from part two indicate that a potential correlation existed between attitude and accuracy of the RR measurements, as illustrated in Fig. 2. Overall, half of the participants indicated negative feelings toward RR assessment.

Key findings include 100% of UAP felt RR assessment is a “boring” task and admitted to estimating the rate. None of the licensed staff reported RR as a boring task, but 66% admitted to estimating the rate. Only one of the UAP, the nursing student, felt confident in the pathophysiology and importance of accurate RR data.



**Fig. 2.** V-Scale data analyzed.

In the clinical setting, UAP are tasked with assessing and documenting vital signs. The results of this pilot study raise concerns, as RR data is vital in the efficacy of sepsis early warning systems[3]. UAP delegated the task of collecting and documenting vital sign data potentially lack the nursing education and clinical judgment necessary to recognize abnormal findings on a per patient basis. The efficacy of early warning systems is reliant on nurses' assessments and clinical judgment; therefore, delegating nursing tasks to unlicensed personnel may place at-risk patients in unsafe and life threatening scenarios.

More research is needed with a larger sample size to confirm the correlation between education achieved, attitude toward, and accuracy of RR data.

### Statement of Research Advisor

Vital signs are measurements of patients' basic functions and are routinely monitored by health care providers. Unlicensed assistive personnel are often delegated the task of collecting and documenting vital sign data. This pilot study highlighted the need for educating unlicensed assistive personnel about the importance and procedure for collecting vital signs accurately. Future work should be done to verify these pilot results.

- Dr. Pao-Feng Tsai, Associate Dean for Research, College of Nursing

## References

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## Authors Biography



Melissa F. Freeman is a senior pursuing a B.S. degree in Nursing at Auburn University. She initiated this research idea and played key research roles in this project. Melissa is a Registered Nurse practicing in the fields of pediatrics and emergency medicine. Upon graduation, Melissa intends to further her academic career with a master's degree in nursing – Family Nurse Practitioner, as well as a PhD in Nursing education, aspiring to teach and research at the university level.



Dr. Pao-Feng Tsai is the Associate Dean for Research and Professor in Auburn University's College of Nursing. Her research areas of expertise are chronic pain assessment and intervention, geriatric care, and development of nursing theories. Dr. Tsai is a fellow of the American Academy of Nursing and the recipient of the Betty McClendon Fuller Endowed Professorship.