Nurses and Midwives in the Digital Age
M. Honey et al. (Eds.)

doi:10.3233/SHTI210790

Exploring the Effectiveness of the Introduction of Automated Physiological Monitoring Devices

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Keywords. Automated physiological monitoring devices, health records, vital signs

1. Introduction

The monitoring of vital signs is used to assess the patient's physiological conditions, an important reference for the healthcare team [1]. Nurses also perform the measurement and recording the vital signs with high frequency [2]. When they login to record vital signs manually, errors would occur which could affect the following diagnoses and treatments. Therefore, at present, the value measured by the devices could be transferred to the database through the gateway, which could be completed by using the automatic physiological monitoring devices to and improve the data accuracy. However, the clinical use rate of the device has not reached 100%. Therefore, the study was to explore the device usage condition and the user's experiences.

2. Approach

This study used secondary database analysis to study the record frequency of body temperature, heart rate, respiration, blood pressure and blood oxygen concentration. This research collected data from June 1, 2018 to May 31, 2019, explored the usage differences between the 3rd, 6th and 12th months. This study also conducted one-on-one interviews for those nurses either in the most user group and the least user group by randomly selected 20 nurses respectively.

3. Body

The results of the differences between the 3rd month, the 6th month, and the 12th month were analyzed by the repeated measurement of the variance analysis (Table 1). The overall analysis of measured parameters are statistical significantly ($p<.0001$). Besides Blood Pressure, the rest parameters aren't shown any difference between the 6th and the

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12th months. Results from the interview revealed the following: 1. Almost 80% of the most user group and 50% of the least user group commented that "The device is easy to use". The reasons nurses considered could impact the usage is the following: "the wireless network transmission is unstable", "Gateway has poor power storage", "Gateway interface is unstable", and "the bar code scanner is not available and sensitive enough to work". "Poor quality of pressure cuff to measure blood pressure". 2. The recommendations for improvements are as the following: the transmission response time, barcode scanner sensitivity, Gateway power storage, ear thermometer accuracy and transmission speed, Gateway interface button instruction clearly stated.

Table 1. The differences between the 3rd month, the 6th month, and the 12th month were analyzed.

Month	Body tempera-ture	Heart rate	Respiratio n	Blood pressure	Blood oxygen concentra-tion	Description
The overall analysis	F： 833.5***	F： 809.8***	F： 794.8***	F： 1282.0***	F： 651.9***	The overall analysis of measured parameters are statistical significantly
The third & The sixth	F： 29.3***	F： 29.6***	F： 29.53***	F： 53.3***	F： 40.1***	The third month and the sixth month were p<0.001
The third & The twelfth	F： 37.3**	F： 36.3***	F： 38.6***	F： 53.3***	F： 14.7***	The the third month and the twelfth month were p<0.001.
The sixth & The twelfth	F：2.7	F：2.4	F：2.7	F：4.4*	F：3.3	Besides Blood Pressure, the rest parameters aren't shown any difference

* p <0.05, *** p < 0.001

4. Conclusions

With the extension use of automated device introduction, the familiarity of device operation and user willingness to use the device can both be increased. At the 6th and 12th months, only the blood pressure automation function continued to improve, indicating that after the measurement is completed, the automatic upload of data can be loved by users. Additionally, the usage frequency can be used as the evaluation of the system effectiveness of the introduction of automated devices. Another recommendation for the device use is to improve transmit response through wireless network. Other factors include the following: Gateway stability, Gateway interface operation instruction, bar code scanner sensitivity, ear thermometer accuracy, ear thermometer transmission speed and the improvement of administrative process.

References

[1] Ching HT, Ya CJ, Su KC et al. An innovative system for intelligent healthcare: Application and comprehensive efficiency. Journal of Healthcare Management 15(2) (2014),128-149.
[2] Yan CK, Shiow RJ, Ching JK et al. Effects of the Assessment and Management Program on the sixth vital signs. Journal of VGH Nursing 30(1) (2013),18-28.