Use of Isabel Decision Support to Improve Diagnostic Accuracy Among Pediatric Nurse Practitioner (PNP) Students

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Abstract

Purpose

Patient safety experts have targeted errors in diagnosis as a problem for health care providers.1 Developing diagnostic skills by using standardized clinical cases is a common practice in patient simulation sessions and a common way of studying diagnostic abilities of physicians, residents, medical students and advanced practice nurses (APNs). 2,3,4,5,6

The use of diagnostic decision support may improve diagnostic ability, but few studies have addressed APN students. 7We employed the use of Isabel Diagnostic Decision Support (IDDS) as a curricular innovation as part of the Wireless Informatics for Safe and Evidence-based (WISE) APN Care project. The Isabel IDEAS component was used as a platform for delivery of standardized clinical cases and related data collection; the decision support component was used as an intervention to improve diagnostic reasoning.

The specific aims of the study were to (1) evaluate the diagnostic accuracy of PNP students pre and post using IDDS for clinical decision support; (2) evaluate the relationship between diagnostic accuracy and level of difficulty, (3) evaluate the relationship between the case difficulty and the diagnostic confidence of the student.

Methods

The study design is a repeated measures design (2 points). PNP students (n=37) read 20 gold standard case presentations, which were ranked as easy, moderate, and hard. Students were asked to identify the key history points then develop a differential diagnosis, diagnostic work up, and treatment plan. The latter three points required students rank their level of confidence from 1-100. The students repeated the process after utilizing the IDSS. The use of IDDS was integrated into coursework and included in the course grade.

We summarized the proportion of correct diagnosis for each level of difficulty before and after IDDS and tested the significance of improvement by logistic regression, accounting for correlation of repeated responses within each case and individual by mixed modeling of fixed and random effects. Among those who correctly diagnosed the cases both pre- and post-IDDS, we assessed for change in ranking of the diagnoses, as well as change in level of confidence in the diagnoses ----------

Results

Overall, the proportion of correct diagnoses increased significantly from 67% to 73% after IDDS (p=0.0006). This varied for ‘easy - 84% to 89% (p=0.14), ‘moderate’ - 75% to 81% (p=0.01), and ‘hard’ - 34% to 41% (p=0.07). Among those who correctly identified the diagnoses pre- and post-IDDS, the ranking of the correct diagnoses improved in 41% of the responses. Correspondingly, the confidence level of the correct responses improved by 2.5% from 78.2% to 80.7% (p<0.0001). Conclusion The initial results suggest that IDDS can be useful in developing differential diagnosis skills in PNP students. ----------

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