CrossMark

JNP

Nurse Practitioners' Versus Physicians' Diagnostic Reasoning Style and Use of Maxims: A Comparative Study

Alison M. Pirret, PhD, NP

ABSTRACT

The study used an intuitive/analytic reasoning instrument and maxims questionnaire to compare 1) the diagnostic reasoning style of 30 nurse practitioners (NPs) and 16 resident doctors and 2) its influence on their diagnostic reasoning abilities of a complex case. The results showed NPs incorporated more system I (intuitive) processes when compared with residents; however, both groups identified with certain maxims. Diagnostic reasoning style was not related to participants' diagnostic reasoning abilities, indicating they triggered system II (analytic) processes when required. Although system I processes are essential, clinicians need to be aware of the value and pitfalls associated with them.

Keywords: diagnostic reasoning style, maxims, nurse practitioner

The first New Zealand (NZ) nurse practitioner (NP) was registered in 2002, with the 100th NP being registered in early 2012.[1] In NZ, the title NP is legally protected and can only be used by nurses with a master's degree who have passed rigorous assessment processes.[2] Legislation in NZ allows NPs to practice independently without physician supervision.[2]

Research shows NPs and resident doctors have similar patient outcomes and diagnostic reasoning abilities.[2] Diagnostic reasoning requires clinicians to collect relevant assessment data, retrieve memorized knowledge, and integrate data in the working memory. Because of limited capacity in the working memory, this process can overstretch the cognitive resources and create congitive overload, which risks diagnostic error.[3] Singh et al[4] suggest 12 million United States adults are affected by diagnostic error every year. Because diagnostic reasoning style impacts on diagnostic accuracy,[5] it is worthy of further exploration.

This study compared NPs' and resident doctors' diagnostic reasoning style and use of maxims to guide their diagnostic reasoning. It answered 3 questions: 1) How does NP diagnostic reasoning style compare with that of residents? 2) How do maxims used by NPs in their diagnostic reasoning compare with those used by residents? and 3) Are NPs' and residents' diagnostic reasoning ability scores described by Pirret et al[2] influenced by their diagnostic reasoning style and use of maxims in everyday practice? The first 2 questions were based on the assumption that as NZ NPs were expected to have more years of experience than residents, they were more likely to use system I processes in their diagnostic reasoning.

BACKGROUND

Dual process theory identifies diagnostic reasoning uses system I (intuitive) and system II (analytic) processes; the degree to which each is used is dependent on the clinical situation.[5,6] System I processes are fast and are used automatically when clinicians are involved in familiar case presentations. They use cognitive shortcuts or rules of thumb, commonly termed heuristics, to reduce the cognitive load and simplify the diagnostic reasoning process.[5,7] These heuristics based on experience, patient characteristics, and the context in which the patient presents enable clinicians to reach a diagnosis without proceeding with the time-expensive process of exploring unlikely diagnoses.[5]

If the patient presentation is not initially recognized, time does not permit, or the clinician is

uncertain, the slower, logical, and deliberate system II processes are used.[7] Both system I and II processes need to fail for diagnostic error to occur, system I for making an error and system II for not detecting and correcting it.[8] An example of this is when contextual factors, such as clinician overconfidence or fatigue, are combined with a complex case presentation with features that reflect multiple diagnoses,[9] such as those described in Box 1. Contextual factors triggered by system I processes create the error, whereas failure to take a complete patient history or perform the appropriate physical examination leads to system II failure. Failure of both the system I and II process leads to diagnostic error and an inappropriate management plan.

Different types of diagnostic reasoning use either system I or II processes. Intuition and pattern recognition use system I processes, whereas the hypothetico-deductive model and clinical guidelines use system II processes. Intuition is based on past experiences, is generated without mental effort, and is commonly described as a gut feeling.[6] Pattern recognition is when the clinician makes a diagnosis based on a few pieces of critical information gained from the clinical context and memorized signs and symptoms[5]; this process allows an almost instantaneous realization that the patient's presentation resembles memories of previous cases.

Maxims also serve as a heuristic and are thought to aid in memory. They are succinct sayings developed by experienced clinicians.[10] Each maxim is case specific and not suitable to be applied to all patients.[10]

The hypothetic-deductive model is an approach predominantly used by novice clinicians. It uses inductive and deductive reasoning to guide clinicians to the most correct diagnoses.[7] Clinical guidelines are used to interpret and treat certain conditions and are thought to be useful in improving the performance of novice clinicians.[11]

NP Diagnostic Reasoning Styles

Most research exploring NP diagnostic reasoning style was published 10 to 20 years ago.[12] These studies identified NPs used system I and II processes including intuition, pattern recognition, maxims, and the hypothetic-deductive model.[12,13] Intuition was used to alert NPs to issues, which was then followed by a search for more objective data to support their concerns.[13] The maxims NPs used included "real disease declares itself, follow-up everything, and common things occur commonly."[13]

Medical Doctor Diagnostic Reasoning Styles

System I and II processes are incorporated into medical doctor (MD) diagnostic reasoning, but experience determines how they are used. When using pattern recognition, novice doctors use familiar and irrelevant factors to support diagnoses, such as name, occupation, age, and similar situations.[14] This is in contrast to experts who support diagnoses with memorized signs and symptoms learned from experience.[15]

Although MDs use the hypothetico-deductive model, it is only used by experts when analyzing complex or unfamiliar cases.[16] Medicine is beginning

---

Box 1. Example of a Complex Case

A 61-year-old non—English-speaking woman presents with a 1-week history of generalized malaise, fevers, posterior chest pain, productive cough with purulent sputum, increased shortness of breath, and abdominal pain. She is accompanied by her daughter, who is able to translate. She visited her general practitioner 3 days ago and was prescribed an antibiotic but feels she is getting worse. She has a history of poorly managed type II diabetes, hypertension, hyperlipidemia, and osteoarthritis of her right knee for which she takes acetaminophen and a nonsteroidal anti-inflammatory drug. She is obese but has had an unintentional weight loss of 8 kg over the past 6 weeks. She is a smoker with a 40—pack year history.

She is hypertensive with a slightly raised respiratory rate. She has right basal crackles on auscultation and has dullness over the right base on percussion. Right-sided chest pain is present on inspiration and coughing. Abdominal palpation reveals right upper quadrant tenderness.