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11-1-1987

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Accepted version. *Heart & Lung*, Vol. 16, No. 6 (November 1987). Publisher Link.
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Methods to validate nursing diagnoses

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Ever since nurses began officially to label the phenomena that they diagnose and treat, there has a need to validate the existence of those phenomena. Nurses who use the official North American Nursing Diagnosis Association (NANDA) list of nursing diagnoses often find the diagnostic labels and their defining characteristics are not relevant and are not what they identify in clinical practice. If this problem continues, nurses will not have confidence in the official diagnoses and will view them, at best, as an academic exercise imposed by nursing leaders divorced from the real world of nursing. A source of the problem is that many of the nursing diagnoses on the current NANDA-approved list were included with little empirical evidence. To be on the improved list means that the diagnosis has been accepted for further testing, validation, and refinement.[1]

Although there is a need for empirical validation of nursing diagnoses, few practical approaches on how to proceed have been developed. I have developed two validation models that, if used, could standardize validation evidence for nursing diagnoses.[2] Nurses from across the country have been using these models to validate a variety of nursing diagnoses, and some of the results have been published.[3-5]

The purpose of this article is to present an updated version of the models of validation that I have developed. Problems of the application of these models will be discussed, and solutions will be presented.

Meaning of Validation

A beginning understanding of validation as it applies to nursing diagnoses can be obtained from the dictionary. The college edition of *Webster's New World Dictionary of the American Language*[6] states that something is valid when it is “well grounded on principles or evidence" and is “able to withstand criticism." A valid nursing diagnosis, then, is one that is well grounded on evidence and is able to withstand the criticism of professional nurses.

Gordon[7] recently stated that "validity describes the degree to which a cluster of defining characteristics describes a reality that can be observed in client-environmental interaction." This definition expands the understanding of a nursing diagnosis in that a nursing diagnosis is essentially a cluster of characteristics that nurses put a label on for communication purposes. These defining characteristics are valid when they actually occur and can be identified as a cluster in the clinical situation. For example, when nurses communicate that they have

diagnosed anxiety in a patient, they mean that the patient has exhibited a meaningful grouping or cluster of subjective and objective characteristics (e.g., tension, restlessness, sweaty hands). Nurses could just say that they have a patient who is restless and tense and has sweaty palms, but it is much easier, for diagnostic and communicative purposes, to say that they have an anxious patient.

The problem with nursing diagnoses is that there are few defining characteristics that nurses agree on as commonly identifiable and as suitable for labeling. Gathering evidence that nurses actually do identify common defining characteristics is the process of validation. As Gordon and Sweeney[8] have stated, the process of validation "involves determining if the pre-identified defining characteristics occur as a cluster in a sufficient number of cases."

Gordon and Sweeney's definition of the process of validation for nursing diagnosis implies two important assumptions. First, validation of nursing diagnoses assumes that the nursing diagnoses and the defining characteristics have already been identified and that there is sufficient evidence for the diagnosis to be placed in the official NANDA taxonomy. The second assumption is that validation of nursing diagnoses does not mean that the individual nurse has made a valid diagnosis; rather, it means that many nurses are making similar diagnoses on the basis of similar defining characteristics. A sufficient number of cases, therefore, is important for determining generalizability of findings. For example, does the cluster of tension, restlessness, and sweaty hands indicate the same type of anxiety for a patient in the intensive care unit in Florida as the anxiety diagnosed by a psychiatric nurse with a patient in a psychiatric day care setting in Oregon? Clinical generalizability of a diagnosis is what Gordon[7] refers to as "external validity." Whether a nurse uses good clinical judgment and makes a valid diagnosis for an individual patient could be referred to as "internal validity."

Another understanding of validation can be taken from the research process. In conducting studies, researchers often measure concepts or variables of an abstract nature. For the study to be scientifically sound, the tools to measure the variables of interest need to be valid and reliable. If the tools are not valid and reliable, then the study results would be suspect and the evidence generated would not hold up to criticism. A researcher cannot just assume that a tool is valid and reliable but must also provide evidence that can be understood by the scientific community.

There are common, or standardized, ways of providing evidence for the reliability and validity of measurement tools in research. This standardized evidence provides scientific confidence in the use of research tools and in the results of the research study. A similar confidence needs to be established for nursing diagnoses, and similar standardized methods to

obtain evidence for that confidence need to be developed and used. I have proposed that two major sources of evidence for the validity of nursing diagnoses be obtained: clinical and expert.[2] If evidence exists (from experts and from the clinical situation) that a critical cluster of defining characteristics indicates the existence of a valid diagnosis, then a practicing nurse could have confidence in the use of that nursing diagnosis. In addition, this evidence will help a nurse to know which defining characteristics need to be identified before the diagnosis can be made.

Validation Models

The first validation approach that will be described is called the diagnostic content validation (DCV) model. This model is based on obtaining expert opinions from nurses on the degree to which each defining characteristic is indicative of a given diagnosis. The defining characteristics of the diagnosis under consideration are taken from the preestablished characteristics of the official NANDA diagnosis. Before this model is used, a literature review should be conducted to provide literature support for the diagnosis and defining characteristics. Additional characteristics could be added from the literature review. Some nurses who have used this model also add "phony" characteristics to verify that the experts are not just responding randomly.[9]

The steps for the DCV model are as follows:

1. "Experts" rate each defining characteristic of the diagnosis being tested on a scale of 1 to 5. On the scale 1 = not at all characteristic or indicative of the diagnoses; 2 =very little characteristic of the diagnosis; 3 = somewhat characteristic; 4 = considerably characteristic; and 5 =very characteristic.

2. Use the Delphi technique to obtain a consensus. This step is optional because the Delphi technique[10] could take a considerable amount of time and decrease the response rate. The Delphi technique, however, is an excellent method of obtaining consensus from a group of experts: The method is autonomous, it provides feedback, and it uses repeated rounds of questionnaires.

3. Calculate weighted ratios for each defining characteristic. The weights are as follows: 1 =0; 2 = 0.25; 3 = 0.50, 4 = 0.75; and 5 = 1. The weights are provided so that the total score can reach only 1.0 and so that a value will not be given to a defining characteristic that the experts judge to be not at all indicative of the tested diagnosis.

4. Discard the defining characteristics with weighted ratios less than 0.05. This step is tentative and is taken only until a study with a large sample of clinical experts from across the country has been completed or until repeated smaller studies provide confirmation of results.

5. Defining characteristics with weighted ratios greater than or equal to 0.80 will be considered as "major." Defining characteristics with ratios less than 0.80 but greater than 0.50 will be labeled as "minor." This tentative step is taken only until results have been confirmed with repeated studies or with a generalizable study. Until such confirmation is obtained, the defining characteristics will be called "tentative major or minor indicators."

6. Obtain a total DCV score by summing the individual ratio scores and dividing by the total number of defining characteristics of the tested diagnosis. Defining characteristics with ratios less than or equal to 0.50 should not be included in total score.

According to this model, defining characteristics are labeled as "major" if they reach a score of 0.80 or greater. The rationale is that this score means the experts agree that the defining characteristics are very much indicative of the diagnosis being tested. According to NANDA guidelines, "major" characteristics must be present for a diagnosis to be made. The 0.80 score for reliability coefficients for measurement tools is a standard cutoff score.[11]

One of the difficulties in implementing this method is obtaining nurses who are experts in the diagnosis being tested. According to the American Nurses' Association Social Policy Statement, specialization in nursing occurs at the master's degree level. Ideally, if the master's degree is the first level of specialization, nurse raters should at least have a master's degree in the clinical practice of nursing. Besides education, a number of other areas could be taken into consideration to determine expertise: (1) years of experience in nursing practice (2) research conducted on the diagnoses of interest, (3) articles published on the diagnoses, and (4) conferences attended and courses completed that are relevant to the nursing diagnosis. Now that NANDA and other professional nursing organizations, such as the Midwest Nursing Research Society, are asking members to indicate their areas of research and nursing diagnosis interest, lists of members could be obtained from these organizations and used as a source of experts. The expertise of the nurse raters and the evidence for their expertise is critical for the validity of the DCV model. Without expert nurse rates the evidence for the nursing diagnoses being tested will be suspect.

The second approach to obtain validity for a nursing diagnosis is called the clinical diagnostic validity (CDV) model. This model is based on obtaining evidence for the existence of a given diagnosis from the actual clinical setting. The original CDV model used a clinical observation approach, with two expert clinicians doing the observations and the ratings. The modified CDV model could use this approach or could involve obtaining clinical information directly from the patient-subject. The approach chosen will depend on the nature of the

diagnosis being tested. If the diagnosis involves a more cognitive or affective response, than the direct patient approach would probably be the best. If the nature of the nursing diagnosis relates more to performance or physiology then a direct observation approach would be appropriate. Regardless of the approach used, an important step to include before using the models is to describe clearly each of the defining characteristics of the diagnosis being tested. If possible, operational definitions should be developed for each defining characteristic.

The steps of the CDV model using the observational approach are as follows:

1. Two clinical experts assess a given number of patients (e.g., 50) with the preestablished diagnosis that is being tested.

2. Both clinicians observe for the presence or absence of each defining characteristic of the diagnosis being validated. Each defining characteristics needs to be operationally defined before the actual assessment.

3. Calculate the weighted interrater reliability ratios for each defining characteristic by the following formula:

$$R = \frac{A}{A + D} \times \frac{\frac{F_1}{N} + \frac{F_2}{N}}{2}$$

where A = number of agreements; D = number of disagreements; F_1 = frequency of characteristics observed by the first rater; F_2 = frequency of characteristics observed by the second rater; N = number of subjects observed; and R = weighted interrater reliability ratio. The remaining steps are the same as for the DCV model.

The diagnosis and defining characteristics that are being validated should come from the official NANDA list, and a prediagnosis should be made by a professional nurse other than the researcher. If possible, the validity or correctness of this professional nurse's diagnosis should be tested, perhaps by using some other type of valid and reliable measurement tool that has been developed to measure the phenomenon being validated. For example, Fadden et al.[3] used the State-Trait Anxiety Inventory, developed by Spielberger and others, in a study to validate the nursing diagnosis of anxiety. Having an equivalent measure of the diagnosis being tested will help to establish a concurrent type of validity.

The formula used in this model to obtain weighted ratios is the standard formula for interrater reliability; it is modified to take into account the relative frequency of a given defining characteristic. The defining characteristics are weighted according to the frequency of observation by each rater. This is done to prevent a defining characteristic that is infrequently

observed but has interrater agreement from becoming a highly rated defining characteristic.

Another version of the CDV model is the patient-focused approach. With this approach, it is not necessary to have two raters. This approach would be best for the affective type of human response, such as powerlessness, hopelessness, and anxiety. The steps for the patient-focused CDV model are as follows:

1. Obtain a sample of patients-subjects with a preestablished current diagnosis of interest. For example, one could select all (or a sample) of the patients in a hospital, unit, or clinic with a current diagnosis of interest. If the diagnosis is somewhat rare, sampling might take place over a specified period. The method of sampling will need to be determined by the nurse researcher and will be dictated by the given situation and diagnosis.

2. Validate that the diagnosis was correct by using an equivalent measure of the diagnosis. If an equivalent measurement tool is not available, then confirmation of the diagnosis by a clinical nurse specialist would be recommended.

3. Develop a list of the defining characteristics of the diagnosis that is being tested with a rating scale. This list of defining characteristics is then given to the patients with the preidentified nursing diagnosis. The patients are then asked to rate each of the defining characteristics on how indicative of their feelings or behaviors that characteristic is on a scale of 1 to 5. The rating scale would be similar to the rating scale used for the DCV model. The rating scale would be interpreted as follows: 1 = not at all characteristic of me; 2 =very little characteristic of me; 3 =somewhat characteristic of me; 4 = considerably characteristic of me; and 5 =very characteristic of me.

4. As in the DCV model, weighted ratios would be calculated for each of the defining characteristics. The weights are as follows: 5 = 1; 4 = 0.75; 3 = 0.50; 2 = 0.25; and 1 = 0.

The remaining steps for this model are the same as those in the DCV model. A combination of the two types of CDV models could be used with a given nursing diagnosis, depending on the nature of the defining characteristics (i.e., some of the defining characteristics might be more observable than others).

Differential Diagnostic Validation

Two frequent diagnostic problems are differentiating the diagnoses of interest from closely related diagnoses and differentiating levels of the same diagnosis. For example, the nursing diagnoses of fear and anxiety are often mistaken for each other.[12] Furthermore, some nurses have indicated that anxiety can be diagnosed or differentiated on three levels: mild,

moderate, and severe.[7] To validate the differences between two closely related diagnoses or to differentiate levels of a given diagnosis, I propose the differential diagnostic validation (DDV) model. The DDV approach could be used with nurses who are experts on the given diagnosis or with patients who have received the diagnosis that is being validated. The steps of this model using nurse experts are as follows:

1. Select a pair of similar diagnoses (or levels of the same diagnosis) that you wish to differentiate.

2. Have an adequate number of nurse experts (e.g., 50) rate the defining characteristics of the two diagnoses. All the defining characteristics of both diagnoses should be included together. The nurse experts, however, should be told only to rate the diagnosis of interest; they are not told that defining characteristics from another diagnosis are included. The characteristics are rated on a scale of 1 to 5, previously described for the DCV model.

3. As in the DCV model, weighted ratios are calculated for each defining characteristic, and decisions can be made as to whether the defining characteristics are major or minor (i.g., greater than or equal to 0.80) or whether they should be dropped (i.e., less than or equal to 0.50).

4. The defining characteristic ratios from both diagnoses are then compared. If there is a significant difference in the two diagnoses or the levels of the same diagnosis, then the defining ratios of the diagnosis being tested should be significantly higher than the defining characteristic ratios from the diagnosis being differentiated,

5. The next step is to readminister the questionnaire on the same defining characteristics to the same nurse experts or to an equivalent number of different nurse experts. This time they rate the characteristics on how well they relate to the paired diagnoses. For example, in the first round the nurse experts rate the defining characteristics of both "fear and anxiety" on how indicative the characteristics are of anxiety, and in the second round they rate the defining characteristics on how indicative they are of fear. Weighted ratios would again be calculated on all the defining characteristics, and comparisons would be made.

The procedure described above could be simplified by obtaining a large group of nurse experts (e.g., 100) and randomly giving half of the group a list of the defining characteristics of one diagnosis and the other half a list of the defining characteristics of the differential diagnosis.

This procedure could also be applied to the clinical setting and to the individual patient. In this approach you would find a sample of patients with a preidentified diagnosis (e.g., mild anxiety) and give them a list of the defining characteristics of both the diagnosis of

interest and the differential diagnosis. Then you would find an equal number of patients with the preidentified differential diagnosis (e.g., fear) or perhaps with a different level of the same diagnosis (e.g., moderate anxiety) and ask the patients to rate each defining characteristic. Like the patient-focused CDV model, it will be important to validate the preidentified diagnosis through equivalent measures or through confirmation by a clinical expert.

Conclusion

Since the original validation models were presented and published for the Sixth Conference on the Classification of Nursing Diagnoses, they have been used by many nurses from across the country to validate a variety of nursing diagnoses. Some of the results of these studies are just beginning to be published.[3,4] As more and more of these validation studies are conducted, practicing nurses will have more confidence in the use of the official NANDA nursing diagnoses. There is still a tremendous need to validate nursing diagnoses. Having valid nursing diagnoses that are relevant to the critical care setting will be of particular importance to the health professionals and patients in the critical care settings. The more valid the nursing diagnoses that are used in critical care, the more valid will be critical care nursing practice. The validation models as presented in this article were developed to aid that process.

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Notes

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