Nursing Diagnosis: Maternal Attachment

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THE NURSING process is generally considered the foundation for nursing practice. The process consists of five sequential actions: observation and data collection, nursing diagnosis or clinical inference, a plan for nursing intervention, implementation of the intervention, and evaluation of the effectiveness of the intervention. Since the second step, nursing diagnosis, is the least understood and certainly the most controversial of these steps, perhaps developing a method for systematically arriving at a nursing diagnosis and demonstrating its use in a clinical setting will help in carrying out nursing practice.

A MODEL FOR NURSING DIAGNOSIS

Several articles in nursing literature have pointed out the difficulties implicit in making nursing diagnoses. Perhaps the most articulate have been those by Kelly and Hammond on clinical inference in

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nursing.[1,2] In a series of studies, these authors attempted to identify how nurses arrived at their clinical decisions. Using the Lens Model, they studied: (1) how nurses use the sign/symptom/action complex in patient situations, (2) how the information value of various cues actually used by nurses compared to the predetermined information value of the same cues, (3) how nurses selected cues in an order which would reduce their uncertainties, and (4) to what extent nurses revised their estimates about patients in a predictable way. Most of the results of their studies were inconclusive, though they did indicate that nurses have an inference system which is unique to the individual and which is used consistently.[2] Kelly mentions that a nursing diagnosis or inference must be made within a complex system and often in circumstances requiring immediate action.[2]

It seems obvious from Kelly's writings that she perceived inference and diagnosis to be synonymous. Aspinall also defined nursing diagnosis as clinical inference. In a study of 187 hospital nurses, a patient case study was presented and the nurses were asked to list all of the possible causes of the patient's disorder. There was a total of 12 possible causes, but the nurses' lists ranged from one to nine causes.[3] Nurses with less than ten years' experience named a significantly larger number of causes than those with more than ten years' experience. Aspinall concluded that nurses lacked both theoretical knowledge of possible causes of problems and means of evaluating cues systematically.

Doona considered nursing diagnosis a judgment process. She postulated interaction between nursing concepts and nursing facts in arriving at a nursing judgment. Following interaction, there is an attempt to order or compose a proposition from the concepts. The proposition is then thoughtfully considered and a judgment made.[4]

Both Doona and Aspinall spoke of the need for ordering relationships or making systematic efforts to determine useful cues. This action suggests the use of a taxonomy of nursing diagnoses similar to taxonomies used by medicine, education and some of the social sciences.

Gebbie and Lavin have proposed a taxonomy for nursing diagnoses suggesting that the taxonomy describe words for operationally describing patients' states. The proposed taxonomy would also contain "a hierarchy of conceptual categories."[5(p25)]

A similar suggestion was made by Dickoff, James and Wiedenbach when they proposed four levels of theory. The first level, or naming theory, is the level where factors are isolated and concepts are analyzed. This activity is most often called classifying.[6]

Henderson suggested that the *process* of diagnosis was the same for both medicine and nursing. The difference between the two disciplines is in the relational phenomena which direct the problem-solving actions each takes. The focus of nursing is

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on the treatment of human responses to "intrapersonal, interpersonal, and environmental stressors" while that of medicine is on the treatment of disease.[7(p82, 83)]

If Henderson is correct, a look at the medical model for arriving at diagnoses is appropriate. Feinstein suggested the use of a taxonomy for medical diagnosis using Boolean algebra and Venn diagrams to picture clusters of symptoms that form specific diseases. He also suggested a seven-step method for arriving at a taxonomy.

1. For each disease, survey a large number of patients and note the presence or absence of all pertinent clinical properties.
2. Analyze the properties for frequency of occurrence.
3. From the analysis, group the individual properties into sets of related properties which will represent the total situation under consideration.
4. After the major sets are arranged, define subsets.
5. Choices of appropriate properties and sets for any clinical pattern must be individualized, depending on the purpose of the classification.
6. Construction of a Venn diagram puts the sets and subsets into a model which provides clarity.
7. Insertion of numbers or labels into the diagram can be used to identify the subsets or to represent counts of objects in that subset.[8(p178-181)]

In an attempt to synthesize the many approaches to diagnosis, a seven-step approach for formulating a nursing diagnosis is proposed.

1. The nurse notices something in clinical practice which either supports a current theory or which seems to be happening consistently. (This first step is based on the assumption that the nurse is a competent observer.)
2. The nurse makes further observations on a small sample of patients. If the observations seem to be consistent with the original idea, a tentative nursing diagnosis can be made.
3. The nurse goes to the literature for documentation of the tentative findings. At this point, a concept analysis is performed to determine which criteria or behaviors occur consistently enough to be provisionally "diagnostic"—that is, which behaviors are identified in the literature as occurring *most* frequently.
4. Once the provisional diagnostic criteria have been determined, then a larger sample of patients should be studied systematically, using the provisional criteria and observing for further provisional criteria which might be present but not documented in the literature. If the provisional behavioral criteria seem to be occurring systematically and consistently, then a formal clinical inference or diagnosis can be drawn—"the identification of criteria A, B and C lead to appearance of the tentative diagnosis X." This is exactly the same as developing a tentative hypothesis or relational statement.
5. Validation is then required. Many different nurses use the criteria to see if they can infer the presence of X from the presence of criteria A, B and C. Evaluation of the results of these observations should produce a weighting of the criteria by counting

how frequently each criterion occurred.

6. Ordering of sets and subsets of criteria, as suggested by Feinstein, is next.[8(p178-181)]
7. Formal hypotheses are formed to determine whether specific nursing interventions affect the patient behaviors that form the basis of the diagnosis. This step then becomes the first step in development of nursing theory.

Once a hypothesis or relational statement can be made using the diagnosis, a systematic study should be undertaken before the hypothesis is used as theory in clinical nursing practice or as the basis for predictions.

VALIDATING THE MODEL

In an effort to validate the model proposed for nursing diagnosis, a study was done using the concept of attachment as the tentative nursing diagnosis.

1. My own clinical observations seemed to support Klaus and Kennell's work on attachment.[9] There did seem to be certain specific behaviors exhibited by mothers when they were becoming acquainted with their infants.
2. After systematically observing five new mothers with their infants, certain behaviors emerged as typical: touching behaviors, vocalization and eye contact. The tentative nursing diagnosis was "maternal attachment."
3. In the process of content analysis, it became evident that there could be attachment to inanimate as well as to animate objects. Therefore, the provisional criteria were examined to see which ones applied to all attachments and which ones applied only to attachments between animate objects. Three criteria emerged as common to all cases of attachment.

- Visual contact must have been made between the person and the object of attachment.
- The object of attachment must have been touched by the person at some time during the process of attachment.
- There must be some positive affect associated with the object of attachment.

Two other criteria emerged as common to cases of animate attachment.

- There must be reciprocal interaction between the two parties in attachment.
- Vocalization by at least one of the two parties is supportive of the attachment process.

One other possible criterion emerged, but the evidence to support it is extremely limited and it is listed here simply as something which needs further investigation. This criterion is: The sense of smell is supportive of the process of attachment.

A review of the literature revealed a wealth of information on maternal-infant attachment. However, most studies focused on the infant's attachment to the mother. Klaus and Kennell are the predominant figures in research on maternal attachment behavior. Based on long-range studies over five years, they concluded that mothers who were more attached to their infants early in the post-

partum period behaved in significantly more affectionate ways toward those children as long as five years later.[9(p59)]

De Chateu, in Sweden, has duplicated Klaus and Kennell's study and obtained the same results.[10] In contrast, Harlow's studies of infant monkeys raised with surrogate wire or cloth mothers have shown that when the infant monkeys became mothers themselves, they were helpless at mothering tasks and lacking in maternal feeling.[11(p69)]

Ainsworth, in discussing infant attachment behavior, listed three maternal behaviors which she found highly correlated with strong infant attachments: (1) a positive attitude toward breastfeeding, (2) the amount of care given to the infant and (3) the mother's excellence as an informant regarding her infant's behavior.[12(p400)]

Cairns has suggested that maternal stimulation of the infant, maternal-infant interaction and infant orientation behavior all play a significant part in the formulation of attachments.[13(p36-37)] Gewirtz listed several criteria needed for the establishment of attachment, including orienting and visual tracking, touching, clinging, crying, smiling, vocalizing and separation anxiety.[14(p181-182)]

Yarrow postulated three steps in the formation of dyadic attachments: (1) selective responsiveness to one person, manifested by overt preferential behavior such as smiling, vocalizing and reaching, (2) behavior indicating certain specific expectations of the object of attachment and (3) separation anxiety.[15]

Bowlby described four phases of attachment: (1) orientation and signals to draw the desired object toward the attaching person, (2) increased differential responsiveness to the desired person or object by auditory and visual stimuli and increased focus on the desired person or object, (3) maintenance of proximity to the desired person or object and (4) formation of a goal-corrected partnership.[16(p266-267)]

Klaus and Kennell described an interaction model into which each party contributes. The mother contributes touch, eye-to-eye contact, high pitched voice, entrainment, time giving, lymphocytes and bacterial flora, odor and heat. The infant contributes eye-to-eye contact, crying, stimulation of oxytocin and prolactin production, odor and entrainment. (Entrainment is defined as interactive, rhythmical synchrony between infant and mother.)[9(p67)]

Klaus and Kennell report two further pieces of research that should be included here. Brazelton has reported that a neonate alerts and attends to a female voice in preference to a male voice.[9(p73)] MacFarlane has reported that breastfed infants can discriminate between their own mother's breastpads and those of another woman.[17(p110-111)] This latter piece of research is the only documentation for the criterion on the sense of smell favoring attachment formation.

Clark and Affonso discussed the need for reciprocal interaction between mother and infant as a means of fostering attachment. They also discussed the mother's need for signals from the infant to tell her if she is satisfying him. They stress the importance of this reciprocal sensory relationship in the formation of attachments.[18(p97-98)]

In a study of 24 mothers, Cannon

examined the concept of maternal touch as described by Rubin and by Klaus and Kennell. Her findings indicated that 18 of the 24 mothers progressed through the orderly sequence of touching as described by Rubin and Klaus and Kennell: Stage 1, fingertips on infant's extremities; Stage 2, fingertips on trunk; Stage 3, hand and palm touching infant; and Stage 4, complete enfolding with arms. "En face" position and verbalization occurred in a large percentage of the sample mothers. "En face" position was defined as mother's face parallel to the infant's face in the same vertical plane of rotation and with the mother's eyes directed toward the infant's eyes. "En face" occurred in 92% of the one-minute periods of study. Verbalizations occurred in 58% of the one-minute periods. A final result was that the mothers of undressed infants reached stages two and four of maternal touch in a significantly shorter time than mothers of dressed infants.[19]

Ambrose indicated that reciprocal interaction is critical to developing attachments. He suggested a pattern in which the infant's smile or cry initiates action by the mother, usually accompanied by her vocalizations. The sound of the mother and the tactile stimulation given the infant release the following response in the infant and initiate eye-to-eye contact. The eye-to-eye contact stimulates further interaction.[20(p207-208)]

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Three other studies arrived at much the same conclusion regarding the need for interaction. Rheingold, after studying infants' exploratory behavior, reported that visual and auditory stimulation of the infant could control the infant's touching of a ball.[21(p177-178)] Wolff's studies on the early development of smiling indicated that eye-to-eye contact, vocalization and touch facilitated the development of the smiling response in infants. He states that these three sensory inputs are very important in developing social interchange between the infant and his parents.[22] After observing mother-infant interactions, Corter concluded that proximity-seeking behaviors are the basis of attachment formation. He classified these proximity-seeking behaviors as visual contact, vocalizations, clinging and touching.[23]

TESTING THE PROVISIONAL CRITERIA

Having found adequate support in the literature, the provisional criteria were then subjected to further validation. Five actual cases were used to test the provisional criteria. When all the cases submitted were found to support the provisional criteria, it seemed feasible to proceed to Step 4, the systematic study of a larger sample of patients.

A study was designed to use the provisional criteria systematically and to observe for additional provisional criteria. An observation tool for maternal attachment behaviors, developed by Klaus and

Kennell and validated over several years in their own research, was used for the study. Three additional observations were made: the receiving behavior of the mother, the mother's vocalization and the state of the infant.

These three additions were made because the preliminary observations indicated that vocalizing was a common behavior, that the state of the infant might affect the mothers' behaviors and that the way the mother received her infant from the nurse at the feeding period might provide some clues about her effect on the infant. Operational measures of these three items were taken from a tool developed by Newton and were used with her permission.[24] Addition of these three items naturally changes the reliability and validity of Klaus and Kennell's instrument. Any conclusions drawn from data using the revised tool must be considered less predictive than those drawn from data using the original tool until further validation is available.

A 300-bed community hospital with an obstetric service handling 200 deliveries a month was chosen as the site for the study. Infants were carried to their mothers every four hours for feeding and then returned to the central nursery. The study was conducted over a two-week period in May 1977. The study sample consisted of 15 primigravidas who volunteered to allow the investigator to observe them with their infants during a 20-minute feeding session. The mothers were all healthy women who had no diagnosed underlying diseases and who had vaginally delivered full term, healthy infants.

The mothers were visited by the investigator at least one-half hour prior to the scheduled feeding. The purpose of the study was explained briefly and the mother was asked if she would participate. For those who agreed, an explanation as to how the observations would be made was provided. Each mother was told that she could withdraw from the study at any time, even during the observation period, if she changed her mind.

The mother was told that the investigator would not speak or interact with her during the observation period but that any questions she had could be answered before or after the observation period. An offer was made to share the results of the study in written form with any mother who was interested.

The observation period consisted of 20 one-minute segments. The investigator observed the interaction between mother and infant for the first 20 seconds of each one-minute segment. The remaining 40 seconds were used to record the observations on data sheets. At the end of the 20 minutes, the mother was thanked for her cooperation, any questions were answered and the investigator left the room.

Given the very small sample size, sophisticated statistical treatment of the data is inappropriate. Only measures of central tendency and of dispersion will be reported. The observations were divided into categories corresponding to the provisional criteria. The categories were reviewed by four maternal-child nurses for face validity.

Analysis of the demographic data revealed that the mothers in this study ranged in age from 16 to 30 with an average age of 23. Eight of the mothers

received analgesic medication within four hours of the observed feeding.

The infant sample consisted of 11 females and four males ranging in age from 12 hours to four days. The average age was one and one-half days. Two of the infants were breastfed. The feedings observed ranged from the first to the fourteenth, with the average being the fourth.

To determine if the provisional criteria were supported by the data, a frequency table was devised which reported measures of central tendency, measures of dispersion and total frequencies occurring in the sample. Table 1 reveals the behaviors that occurred most frequently among the mothers and infants. The maternal behaviors which occurred most frequently were: (1) mother's eyes on baby, (2) "en face"

TABLE 1
Total Frequency, Measures of Central Tendency and Dispersion for Each Behavior by Category of Provisional Criteria*

Behaviors	Mean	Median	Mode	Range	St. Dev.	Total Frequency in Sample
Visual Contact						
Mother's eyes on baby	17.533	18	19	12-20	2.503	263*
"En face"	10.933	11	11	1-18	5.175	164*
Position of mother and infant						
Sit in lap, face	0.800	0	0	0-5	1.473	12
Sit on knees	0	0	0	0	0	0
Head on knees	0.266	0	0	0-3	0.798	4
Head in hands	1.133	0	0	0-16	4.121	17
Touch						
Touching infant						
Fingertips only	2.866	3	0,4	0-8	2.356	43
Fingertips and palms	9.266	8	8	0-17	5.848	142*
Close contact	15.8	20	20	0-20	7.232	188*
Accessory touch						
Stroking	4.600	4	0,4	0-20	3.924	69
Patting	4.866	5	5,7	1-11	2.774	73
Rocking	5.400	4	0	0-19	6.033	81
Bouncing	0.600	0	0	0-3	0.910	9
Active play	0	0	0	0	0	0
Position of mother and infant						
Cradle	11.866	12	15,20	0-20	7.199	178*
Shoulder-touch	2.206	2	0	0-5	1.830	34
Burping						
Gentle	2.800	2	1,2,3	0-9	2.426	42
Vigorous	0	0	0	0	0	0
Clean baby	3.333	3	0,2	0-8	2.636	50
Affect-Positive						
Receiving infant						
Postpones	0	0	0	0	0	0

TABLE 1 (continued)

Behaviors	Mean	Median	Mode	Range	St. Dev.	Total Frequency in Sample
Passive accept	2.00	0	0	0	0	3
Reaches for	3.00	1	0	0	0	12
Accessory touch						
Kissing	0.466	0	0	0-3	0.915	7
Response to crying						
No comfort	0	0	0	0	0	0
Comfort-awkward	0.200	0	0	0-2	0.560	3
Comfort-relaxed	0.266	0	0	0-2	0.593	2
Mother's attention						
Easily distracted	0.733	0	0	0-5	1.334	11
Distracted at times	6.400	5	5	1-15	4.306	96
Completely on infant	12.666	13	15	4-19	5.080	190*
Reciprocal Interaction						
State of infant						
Deep sleep	0.266	0	0	0-4	1.032	4
Light sleep	1.933	7	3	0-9	2.604	29
Drowsy	7.400	7	2,11	1-18	4.968	111*
Alert	10.400	9	9	1-19	4.997	156*
Active	1.133	0	0	0-4	1.767	17
Crying	0.400	0	0	0-2	0.736	6
Feeding behaviors						
Breastfeeding (N-2)						
Mother relaxed	15.500	0	0	15-16	0.707	31
Mother tense	0	0	0	0	0	0
Baby takes nipple	11.500	0	0	9-14	3.535	23
Baby does not take nipple	3.000	0	0	1-5	2.82	6
Bottlefeeding (N-13)						
Bottle out	10.923	10	15	0-18	5.057	142*
Bottle perpendicular	7.307	5	5,9	0-15	4.210	95
Bottle not perpendicular	0.384	0	0	0-3	0.960	5
Nipple not full	0	0	0	0	0	0
Bottle propped	0	0	0	0	0	0
Position of mother and infant						
Encompassing	9.133	8	0,16,20	0-20	7.605	143*
Mother leans into infant	1.066	0	0	0-8	2.120	16
Vocalizations						
Mother						
Singing	0.200	0	0	0-2	0.560	3
Talking	12.733	13	19	4-20	6.681	191*
Cooing	4.600	4	0,2,4	0-15	5.039	69
Infant						
Cooing or noncrying vocalization	1.400	2	0	0-5	1.594	21

*Measures of central tendency and dispersion are calculated from a total of 15 20-second observations for each of the 15 subjects.

position, (3) touching infant with fingertips and palms, (4) close contact, (5) cradle position, (6) bottle out of infant's mouth, (7) encompassing position and (8) talking. The infant behaviors which occurred most frequently were: (1) alert state, (2) drowsy state, (3) sucking and (4) cooing. These behaviors are marked with an asterisk (*).

As shown in Table 1, some behaviors did not occur at all. These were sit on knees, active play, vigorous burping, postponing the receiving of the infant, relaxed comforting of a crying infant, tense breastfeeding and bottles with the nipple not full or propped.

There seems to be reasonable support for the provisional criteria in the data. Two of the highest frequencies occurred in visual contact, three in touch, one in positive affect, four in reciprocal interaction and one in vocalization. In addition, the items in the accessory touch category, when added together, total 232. This lends additional support to the provisional criterion of touch.

In the final analysis, of course, the sample from this study is too small to allow any generalizations to a larger population. The results do indicate, however, that the proposed diagnostic criteria are at least still feasible as useful indicators of maternal attachment. The next step (Step 5) will be to see if several nurses using the same criteria come up with the same results.

The results from the study indicate that the proposed diagnostic criteria are at least still feasible as useful indicators of maternal attachment.

SUGGESTIONS FOR FURTHER STUDY

Suggested areas for further study are: (1) repeat the study, using the same methodology but a larger sample, (2) find a more useful measure of vocalization (much of the talking done by the mothers in this sample was aimed at the investigator who could not reply, or at the roommate who frequently *did* reply, thus starting a conversation and contaminating the vocalization scale!) and (3) if further study still reveals areas of behavior which occur so infrequently as to be useless, drop them from the observation sheets. Additional nursing diagnoses studies should be undertaken using the framework proposed here to determine its validity and usefulness.

In conclusion, "maternal attachment" may be a useful nursing diagnosis if further study supports the proposed diagnostic behavioral criteria. In the meantime, however, the term should be used carefully to avoid misuse and misunderstanding until further support is obtained.

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