

The Influence of the Use of Diagnostic Resources on Nurses' Communication With Simulated Patients During Admission Interviews

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PURPOSE: The aim of this study was to determine how the use of diagnostic resources influences nurses' communication during admission interviews.

METHODS: A randomized controlled trial was performed. Actors simulated patients based on case studies. We analyzed transcriptions of 60 interviews and video recordings using the Roter Method of Interaction Process Analysis.

FINDINGS: Nurses mainly asked closed-ended questions. The use of knowledge sources, such as forms in the PES format or an assessment format, affected communication significantly in several aspects.

CONCLUSION: Prestructured forms may promote comprehensive interviews, but nurses need to be aware that using certain kinds of diagnostic resources may hinder them from asking open-ended questions.

PRACTICE IMPLICATIONS: Nurses need to increase their use of open-ended questions.

TITEL: De invloed van het gebruik van diagnostische kennishulpmiddelen op de verpleegkundige communicatie met simulatiepatiënten gedurende opnamegesprekken.

DOEL: Het doel van deze studie was te bepalen hoe diagnostische kennishulpmiddelen de communicatie van verpleegkundigen kunnen beïnvloeden bij opnamegesprekken.

METHODE: Een gerandomiseerd onderzoek met controlegroep werd uitgevoerd. Simulatiepatiënten (acteurs) representeerden patiëntencasuïstiek. We analyseerden transcripties van 60 interviews en video-opnames met gebruikmaking van de Roter Method of Interaction Process Analysis.

FINDINGS: Verpleegkundigen stelden overwegend gesloten vragen. Het gebruik van diagnostische kennishulpmiddelen, zoals het PES-format en een voorgestructureerd opnameformulier, beïnvloedde de communicatie significant op verschillende aspecten.

CONCLUSIE: Het gebruik van voorgestructureerde formulieren kan uitgebreide opnamegesprekken ondersteunen, echter verpleegkundigen moeten er op bedacht zijn dat deze hulpmiddelen ook belemmerend kunnen werken bij het stellen van open vragen.

PRAKTIJKIMPLICATIES: Verpleegkundigen zouden meer open vragen moeten stellen ten behoeven van het verkrijgen van volledige en evenwichtige informatie in het opnamegesprek.

Before starting an admission interview, nurses can prepare themselves by using several different kinds of resources (McCabe, 2004; Paans, Sermeus, Nieweg,

Krijnen, & van der Schans, 2012): prestructured admission forms based on Gordon's Functional Health Patterns (GFHP) (Gordon, 1994, 2003); prestructured diagnostic

documentation forms in the problem label, etiology, or related factors, and signs and symptoms (PES) format (Gordon, 2003; Paans et al., 2012); and handbooks of nursing diagnoses (NANDA-International, 2004). Nursing education programs in several European countries and in the United States offer students instruction on how to use different kinds of resources during admission interviews to facilitate communication (Schlegel, Woermann, Shaha, Rethans, & van der Vleuten, 2012). Evidence shows that diagnostic resources positively influence nursing documentation (Kautz, Kuiper, Pesut, & Williams, 2006; Müller-Staub, Lavin, Needham, & van Achterberg, 2006; Müller-Staub, Needham, Odenbreit, Lavin, & van Achterberg, 2008; Paans et al., 2012). However, it is unknown how these resources specifically affect nurses' communication during admission interviews.

Aim

The aim of this study was to determine how the use of diagnostic resources—such as an admission form based on the GFHP, a prestructured record form including the PES format, and nursing diagnoses handbooks—influences nurses' communication during assessment interviews.

Methods

A randomized controlled trial was performed to determine how diagnostic resources influence clinical nurses' communication during admission interviews. The interviews were simulated and based on patient case scenarios in which professional actors portrayed as patients. The nurses were aware of the actors' confederate status. Participants were randomly assigned to one of two groups: an intervention group, which consisted of nurses who were permitted to use an assessment form based on the GFHP and standard nursing diagnoses (labels), nursing diagnoses handbooks, and a predefined record form containing the PES format; and a control group, which consisted of nurses who were forbidden to use the resources.

The entire trial, starting from the preparation of admission interviews, was recorded both on videotape and audiotape. During the interviews, an observer noted whether the simulated patient correctly adhered to the script.

Sample

Of the 94 medical centers in the Netherlands, 11 hospitals were randomly selected via stratification according to province. The heads of nursing staff were asked to invite nurses to enroll in the study. Nurses could voluntarily participate during working hours. Participants were informed that some audio and videotaped recordings would be selected for further analyses. Random assignment to each group—intervention or control—was performed by using sealed envelopes; researchers were unaware of group assignment.

Thirty nurses were assigned to each group. In total, 60 video recordings were included in this study. Ten participants from each group were asked to complete an admission interview with either a simulated patient having type 1 diabetes, chronic obstructive pulmonary disease (COPD), or Crohn's disease.

Based on quality analyses of the audio and video recordings, a sample size of 60 (30 participants in the intervention group plus 30 participants in the control group) was necessary to achieve acceptable power (Lan & Lian, 2010; Leon & Heo, 2009). Texts of the admission interviews were transcribed verbatim.

Data Collection

Nurses in the intervention group were allowed to review the following sources while preparing for the interview and during the interview: (a) an assessment form formatted according to the GFHP and standard nursing diagnoses (labels), as described in the *Handbook of Nursing Diagnoses* (Carpenito, 2002); (b) the *Handbook of Nursing Diagnoses* (Carpenito, 2002); (c) *Nursing Diagnoses and Classification* (NANDA-International, 2004); (d) a diagnostic record form subdivided into three columns: problem label (P), related factors or etiology (E), and signs and symptoms (S). Nurses in the control group used no diagnostics resources prior to or during the interview.

To prepare for the assessment interviews, nurses in both groups were given written information about the patient: name, sex, age, and address; profession, family situation, and hobbies; medical history; current medical diagnosis; reasons for hospital admission; and a brief description of the patient's current situation. Each nurse performed one admission interview with a professional actor pretending to be a patient suffering from diabetes mellitus type 1, COPD, or Crohn's disease. The nurses did know that the actors were confederates in the study.

Instrumentation

Instrumental and affective communication. We analyzed the verbal communication process using an adapted version of the Roter Interaction Analysis System (RIAS) (Roter, 1989; Roter & Larson, 2002; Roter et al., 2005). The RIAS instrument has been used in several nursing studies (Caris-Verhallen, Kerkstra, Bensing, & Grypdonck, 2000; Caris-Verhallen, Kerkstra, van der Heijden, & Bensing, 1998; Caris-Verhallen, Timmermans, & van Dulmen, 2004; Kruijver, Kerkstra, Bensing, & van der Wiel, 2001; Kruijver, Kerkstra, Kerssens et al., 2001). The RIAS is a method of coding interaction during a visit as an assessment interview (Roter & Larson, 2002).

The coding approach is tailored to dyadic exchange specific to the medical encounter. All patient and physician or nursing dialogue are coded into categories that may be applied to each speaker.

By using the RIAS, a distinction can be made between instrumental or task-related communication, and affective or socioemotional verbal communication. In the present study, we used a version of the RIAS instrument adapted by Kruijver, Kerkstra, Bensing, et al. (2001). This version consists of 32 behavioral categories. To analyze the prevalence of communication related to the 11 GFHP items (Gordon, 1994), we added an observation scale to the adapted RIAS instrument. Each of the nurses' "utterances" was coded or categorized into one of the instrumental or affective categories, which are mutually exclusive (Kruijver, Kerkstra, Bensing, et al., 2001). "An utterance" was defined as a communication unit that conveys one thought or that is related to one specific interest. An utterance can vary in length, ranging from one word to a sentence containing many words (Kruijver, Kerkstra, Bensing, et al., 2001). Although it was possible also to code patients' communication, we coded only the nurses' communication. Examples of coded utterances are as follows: "Do you sleep well at night?" or "I write down what you mentioned: 'chronic pain.'" Or "So, fatigue starts mainly in the early afternoon?" and "Please, tell me about how you manage stress at work." The RIAS manual provides a list of examples of utterances to use as a

reference, and to be able to use the correct category. Categories are tailored to directly reflect the content and context of the dialogue (Roter, 1989, 2009). By using a list of codes—a code book—it is possible to quantify coded utterances.

Instrumental communication consists of communication related to nursing topics and medical topics. It is influenced by lifestyle issues and psychosocial issues. Examples include guidance and direction through communication, asking questions in order to enhance one's understanding, or requests for clarification. Asking for opinions and experiences is also viewed as instrumental communication (Caris-Verhallen et al., 1998; Kruijver, Kerkstra, Bensing, et al., 2001) (Table 1).

Affective communication refers to social conversations, such as statements and jokes, that have no particular function in nursing activities. Affective communication may encourage a patient to disclose concerns. Paraphrasing, showing empathy, showing understanding, attention, companionship, and intimacy are considered to be forms of affective communication (Caris-Verhallen et al., 1998; Roter, 1989; Roter & Larson, 2002; Roter et al., 2005) (Table 2).

Table 1. Instrumental Nursing Communication (n = 60)

Codes	With sources	Without sources	p value ^a
	Mean (SD)	Mean (SD)	
Instrumental nursing communication	(n = 30)	(n = 30)	
Closed-ended questions: Medical issues	15.71 (8.299)	20.72 (9.888)	.927
Closed-ended questions: Treatment	10.06 (7.465)	9.48 (5.610)	.266
Closed-ended questions: Psychosocial	4.97 (4.278)	5.45 (5.228)	.657
Closed-ended questions: Lifestyle	20.48 (8.322)	22.31 (12.092)	.057
Closed-ended questions: Information	2.13 (2.717)	1.59 (1.900)	.209
Closed-ended questions: Ward issues	24.55 (16.793)	30.34 (21.313)	.196
Open-ended questions: Medical	1.94 (1.843)	2.97 (4.013)	.146
Open-ended questions: Treatment	1.03 (1.643)	0.76 (1.300)	.297
Open-ended questions: Psychosocial*	0.32 (0.653)	0.72 (1.360)	.007
Open-ended questions: Lifestyle	1.52 (2.158)	1.79 (2.226)	.815
Open-ended questions: Information*	0.42 (0.807)	.014 (0.351)	.001
Open-ended questions: Ward issues	2.94 (2.898)	2.07 (1.926)	.178
Information: Medical	4.00 (4.885)	4.72 (4.913)	.562
Information: Treatment	6.23 (6.417)	6.76 (6.490)	.912
Information: Psychosocial	0.55 (1.121)	0.76 (1.215)	.262
Information: Lifestyle	1.84 (2.177)	2.76 (4.413)	.155
Information: Ward issues*	2.97 (7.468)	1.00 (1.439)	.009
Advice: Medical treatment	3.16 (5.060)	2.59 (4.145)	.607
Advice: Lifestyle/Psychosocial	3.55 (5.614)	3.14 (2.924)	.074
Indicating	3.06 (3.054)	2.55 (2.354)	.140
Conversion/change over	11.97 (10.867)	13.00 (10.919)	.755
Asking for understanding*	0.10 (0.915)	0.35 (0.409)	.012
Asking for recurrence/repetition	0.24 (0.693)	0.29 (0.577)	.565
Asking for consent*	0.52 (0.601)	0.19 (1.122)	.010
Asking for opinion	1.00 (4.043)	2.29 (2.018)	.099
Summarizing	0.81 (1.721)	1.24 (1.994)	.441
Suggesting*	8.23 (7.654)	5.62 (4.829)	.024
Thinking	—	—	—

*p < .05.

^aStudent's t test.

Table 2. Affective Nursing Communication (n = 60)

Codes	With sources	Without sources	p value ^a
	Mean (SD)	Mean (SD)	
Affective nursing communication	(n = 30)	(n = 30)	
Personal remarks	5.03 (4.498)	5.38 (3.156)	.132
Laughs/jokes	0.74 (1.413)	0.93 (1.334)	.910
Approval (directly)*	0.06 (0.250)	0.17 (0.468)	.023
Approval (indirectly)	0.06 (3.59)	0.00 (0.00)	.050
Show concern/worry	0.45 (0.961)	0.24 (0.786)	.172
Show agreement/understanding	28.16 (23.264)	33.72 (24.033)	.742
Paraphrase/check	4.65 (3.755)	4.76 (3.440)	.905
Empathy/legitimize	1.55 (2.063)	2.07 (2.604)	.725
Reassurance*	1.61 (2.076)	0.79 (1.292)	.041
Positivity	0.29 (0.938)	0.24 (0.511)	.516
Cooperation	0.19 (0.601)	0.34 (1.645)	.154
Disapproval (directly)	0.29 (0.588)	0.21 (0.675)	.522
Disapproval (indirectly)	0.13 (0.341)	0.07 (0.371)	.244
Encouragement	23.32 (21.896)	21.97 (28.878)	.556
Asking for reassurance*	0.06 (0.359)	0.28 (0.702)	.005
Asking for patients' experience	0.29 (0.643)	0.31 (0.712)	.702

*p < .05.

^aStudent's t test.**Table 3. Gordon's Functional Health Patterns (n = 60)**

Codes	With sources	Without sources	p value ^a
	Mean (SD)	Mean (SD)	
Eleven health patterns	(n = 30)	(n = 30)	
Health perception/management	28.94 (17.474)	31.83 (16.270)	.751
Nutritional/metabolic	4.06 (3.907)	6.38 (4.648)	.206
Elimination	2.03 (2.739)	3.69 (3.318)	.447
Activity/exercise	10.23 (5.637)	11.45 (6.874)	.406
Sleep/rest	1.94 (2.529)	1.69 (2.072)	.419
Cognitive/perceptual*	1.74 (2.503)	3.72 (3.789)	.007
Self-perception/self-concept	3.35 (4.680)	3.48 (4.540)	.993
Role/relationship	6.13 (5.506)	6.55 (5.018)	.774
Sexual/reproductive*	0.13 (0.499)	0.00 (0.000)	.004
Coping/stress/tolerance*	0.84 (1.214)	2.24 (3.158)	.003
Values/belief	0.13 (0.428)	0.10 (0.310)	.552

*p < .05.

^aStudent's t test.

Communication guided by the GFHP directs nurses to collect data about common patterns of behavior that contribute to health, quality of life, and achievement of human potential (Gordon, 1994, p. 69). In the Netherlands, the nursing theoretical framework according to Gordon is used in nursing education programs (Paans, Nieweg, van der Schans, & Sermeus, 2011) (Table 3).

Data Analysis

Two research assistants independently transcribed the interviews. Under direct supervision of the facilitator (WP),

they also independently analyzed the data by examining verbatim transcription texts. They continually compared the analyzed text based on the variables in the RIAS instrument. This approach is a constant comparative method. Analysis of textual data was accomplished by using the qualitative analysis software package ATLAS.ti, version 06 (ATLAS.ti Scientific Software Development GmbH, Germany). The RIAS instrument is primarily used for identification and classification of verbal occurrences, and coded directly from videotapes or audiotapes and not transcripts. Nevertheless, to be able to come to acceptable interrater reliability of the codings, we used transcriptions

and connected to the text tonal qualities of interaction and affective impressions as friendliness and interest based on observation reports and the videotapes. We used the same approach by means of the GFHP (Table 3), other than we based our codes on the theoretical framework of Gordon (1994). The examples (i.e., case histories) given in this framework were used as a reference.

For statistical analyses, we used SPSS version 16.0. Inter-observer agreement for the RIAS instrument was calculated by using Pearson's product-moment correlation coefficients of six transcribed video recordings. The Student's *t* test was used to estimate differences between the two groups—intervention versus control—along with means and standard deviations of codes (utterances) in instrumental nursing communication (Table 1), affective communication (Table 2), as well as the GFHP (Table 3).

Findings

Demographic Data

Registered nurses ($n = 49$) and bachelor's degree nurses ($n = 11$) were included in the study. Of these nurses, 40 (66%) had over 10 years of experience, and 54 (90%) worked at least half time. Their mean (*SD*) age was 38 (10) years; 51 (85%) were female.

Reliability of Measurements

According to Roter (2009), reliable codings can be achieved if the RIAS instrument is used while examining video recordings. First, two independent raters viewed and examined the video recordings. After they examined six video recordings, Pearson's product-moment correlations were calculated. Inter-observer correlations for instrumental communication were 0.22-0.44, and reliability outcomes for affective communication were 0.30-0.66. We judged these values to be unacceptable. Therefore, we transcribed the video recordings verbatim and included nonverbal communication to the transcripts. After the two independent raters analyzed the six transcripts, Pearson's product-moment correlations were calculated again: inter-observer correlations were 0.62-0.88 for instrumental communication, 0.54-0.81 for affective communication, and 0.64-0.78 for communication relating to descriptions of functional health patterns. According to Polit and Beck (2011), observational studies contain, to some extent, unavoidable and expected subjectivity; therefore, correlations of 0.61 and higher are considered to be acceptable. Subsequently, two independent raters coded the data for all 60 transcripts, and then compared each other's results to achieve consensus.

Nurses' Communication in Relation to Diagnostic Resources

The mean (*SD*) proportion of communicative behavior is displayed in Tables 1-3. To estimate differences between

Table 4. Closed-Ended Versus Open-Ended Questions ($n = 60$)

Codes	With sources ($n = 30$)		Without sources ($n = 30$)	
	Mean frequency	%	Mean frequency	%
Nurses' communication				
Closed-ended questions (6 items)	21.4		15.0	
Open-ended questions (6 items)	1.4		1.9	
Total questions	22.8	100	16.9	100

the intervention group (participants permitted to use resources) and control group (participants not permitted to use resources), we performed *t* tests. Significant differences were found for the following items: *open-ended questions psychosocial* ($p = .007$), *open-ended questions information* ($p = .001$), *information ward issues* ($p = .009$), *asking for understanding* ($p = .012$), *asking for consent* ($p = .010$), and *suggesting* ($p = .024$). Both the groups had high mean scores (Table 1).

With respect to the affective communication domain of the RIAS instrument, the control group had significantly higher mean scores for *asking for reassurance* ($p = .005$) and *direct approval* (.023) than the group that used resources (Table 2).

With regard to communication of content related to the GFHP (Table 3), 3 of 11 items were scored significantly different by the two groups: *cognitive/perceptual pattern* ($p = .007$), *coping/stress/tolerance* ($p = .003$), and *sexual/reproductive pattern* ($p = .004$). The control group scored cognitive/perceptual pattern and coping/stress/tolerance higher than the group that used resources. The control group did not mention questions related to sexual/reproductive pattern (Table 3).

The mean frequency of the use of open-ended and closed-ended questions is presented in Table 4. We found a significant positive difference ($p = .017$) between the mean frequency of questions asked by the two groups (22.8 questions for the group that used resources versus 16.9 questions for the control group) (Table 4). The mean length of time (in minutes) that the intervention group used resources related to the assessment is shown in Table 5.

Discussion

The results of this study indicate that the use of knowledge sources, such as a PES format and an assessment form, significantly affects communication during admission interviews in several aspects. Most of the items of the RIAS instrument, however, revealed no significant differences. The group that used diagnostic resources (the intervention group) and the group that did not (the control group) had

Table 5. Duration of the Use of Resources Related to the Assessment (n = 60)

Time	With sources (n = 30)	Without sources (n = 30)
	Mean frequency (min)	Mean frequency (min)
Preparation time not using resources	7	9
Preparation time using resources	3	–
Time during assessment interview not using sources	13	16
Time during assessment using at least one of the resources	4	–
Total duration of assessment	27	25

significantly high mean scores for instrumental and affective communication. Nurses in the intervention group, however, asked more questions during admission interviews than those in the control group, indicating that the use of diagnostic resources may encourage the use of more questions. Nevertheless, for both groups, the majority of questions asked were closed-ended; only a few open-ended questions were posed.

These results provide general information about the quality of admission interviews: nurses need to improve their interview techniques. Thus, it would be important to investigate which communication techniques, when used in combination with knowledge sources before and during the interview, can improve the quality of nurse-patient communication. Communication technique and the duration of resource use may influence communication during the admission interview. In the present study, nurses spent, on average, 7 min using resources for each interview, which lasted an average of 27 min (Table 5). Additional research on the use of knowledge sources is needed in order to be able to interpret techniques and duration time.

Some authors suggest that nurses can improve their communication skills by balancing their use of open-ended and closed-ended questions (Carniaux-Moran, 2008; Fallowfield, Saul, & Gilligan, 2001). Nurses may neglect to ask about important patient-specific information if they do not use open-ended questions during admission interviews. Indeed, both groups of nurses in our study asked few open-ended questions. Posing open-ended questions during admission interviews is important as they enable nurses to thoroughly analyze patients' coping experiences, feelings, and perceptions, as well as beliefs about their disease and prognosis (Charlton, Dearing, Berry, & Johnson, 2008; Kennedy, Barrett, & Ellington, 2004). The use of open-ended questions in admission interviews is especially

helpful in obtaining a broad range of psychosocial information, and may facilitate and stimulate patients to participate in clinical decision making (Florin, Ehrenberg, & Ehnfors, 2006; Siminoff & Step, 2005). Therefore, one important skill for nurses is the ability to balance the use of a variety of questions in interviews.

Methodological Issues

Although the RIAS instrument is generally used to code behavioral interactions observed directly from video recordings, we were unable to obtain acceptable interrater reliabilities when using the instrument without transcripts. Therefore, we transcribed all 60 recordings, included information about nonverbal communication into the transcripts, and analyzed the transcripts using the RIAS domains and items. Reliability of the RIAS instrument was similar to that in Sandvik et al. (2002). Coding was sometimes unclear since some questions were coded into linguistic forms rather than according to function (Sandvik et al., 2002). Nevertheless, the RIAS instrument was found to be a reliable tool in the present study.

Conclusion

The findings of this study demonstrate that nurses have to improve their communication skills to be able to conduct and complete an admission interview properly. Balancing the use of open-ended and closed-ended questions is important because this enables them to analyze patients' experiences, feelings, perceptions, and beliefs about their disease and prognosis. Further research is needed on how to use knowledge sources—on paper and digitally as a computer tool—to obtain the best results during admission interviews. Understanding how to best use knowledge sources in this context will help avoid adverse events that may arise due to insufficient patient information.

Implications for Nursing

The use of knowledge sources in combination with communication techniques was investigated, and this has implications for nursing. We recommend that nurses should focus on receiving adequate training in using diagnostic knowledge sources for assessment interviews. Good communication skills are also vital. To communicate effectively, nurses need to balance using closed-ended and open-ended questions according to a patient's needs. Indeed, understanding the patient's feelings, experiences, and perceptions is necessary in order to achieve quality care at admission and beyond (Carniaux-Moran, 2008).

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