

**Structural visualization of expert
nursing:
Diabetes self-management
education program**

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Purpose

The purpose of this study was to develop structural visualization of the thought, judgment and behavior processes of expert nursing practice in diabetes self-management education, using an algorithm notation method for programmed care.

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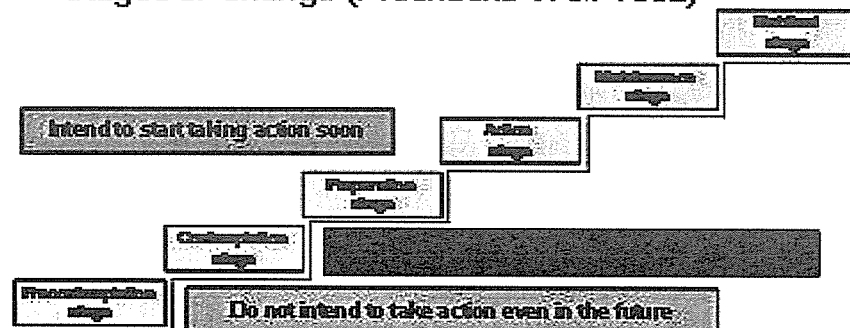
Methods

- Discussion on diabetes self-management education was repeatedly conducted based on the practice experience of expert nurses in the field of diabetes and researchers, using the studies of Prochaska et al (1983) and Kawaguchi (1994) as reference. Focusing on the "action" of implementing dietary therapy taken by the patients on dietary therapy, and the "thought" of the patient on what and how to make efforts, the data were organized and an algorithm was developed.

Study Methods

Theoretical framework of dietary therapy algorithm (1)

- Stages of Change (Prochaska *et al.* 1992)



Study Methods

Theoretical framework of dietary therapy algorithm (2)

Dietary therapy implementation rate (Kawaguchi 1994)

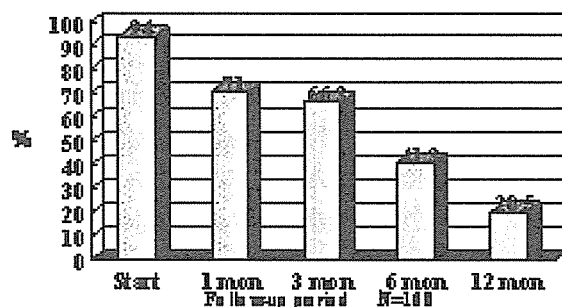


Fig. 1. Changes of diabetic dietary therapy implementation rate (patients at five time)

Ethical consideration

- Anonymity of patients and nurses was maintained during discussion.
- Considerations were given to retain only necessary information in records.

Results

- First, assess whether the patient is implementing dietary therapy along with a nurse. If the patient is implementing dietary therapy, assess whether the dietary therapy is implemented according to the content prescribed by health personnel or according to the patient's own preference. If the therapy is implemented according to the prescription of health personnel, conduct monitor for the periods "less than 1 month from the start of action", "less than 1 month", and "six months or longer".

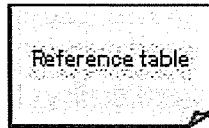
Results

- On the other hand, if the patient is not implementing dietary therapy, assess whether the patient has received diabetes education in the past or is receiving dietary therapy for the first time. Next assess the state of psychological preparation regarding the implementation, conduct monitoring according to individual situation, assess the status of implementation and the disincentive factors, and then repeat short-term and medium-term monitorings.

Notation System for Programmed Care Algorithm

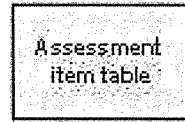
R: Reference table

A table containing data used as reference. System automatically refers to these data while taking actions during operations using the system.



A: Assessment item table

A table containing a list of items used for assessment.



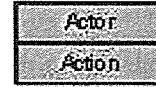
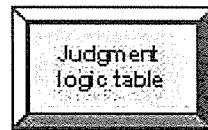
L: Logic reference table

A table containing the logic reference of items. It may include conditions of judgment logic in the future and one or more parameters of the system.



J: Judgment logic table

A table containing judgment logic. This logic is incorporated into the operation of the system.



Action



Thinking



Choice

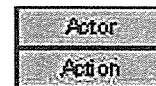
Notation System for Programmed Care Algorithm

Rule for the assigning numbers in the tables of the algorithm diagram

R: Reference table



A: Assessment item table

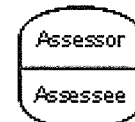


Action

L: Logic reference table



J: Judgment logic table



Thinking



Choice

Structural visualization of expert nursing: Dialysis patient education program “Vascular access management”

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Opening summary

Structural visualization was implemented on vascular access management education for dialysis patients requiring expert nursing. As listening to and recording the sound of the Vascular access is important, an education program involving the electronic recording of sounds was proposed. Recording the Vascular access sounds and utilizing them as part of the education program encouraged a common understanding of the sounds between nurses and patients and helped to achieve a better quality of patient education. It is thought that visualization of nursing practice and the thinking processes of expert nurses which have not been expressly stated previously can become a foundation for more advanced nursing care throughout the profession.

Keywords: Patients education, Hemodialysis, Vascular access

Introduction

To seek out clinical examples of effective expert nursing in the field of dialysis patient education, which have nevertheless not been previously put into standard form or subjected to theory-based systematic exposition, on which to implement structural visualization. It aims to develop an education program for vascular access self-management in hemodialysis patients.

Methods

1. The literature review and web searches.
2. Interviews with five nursing professionals from two Japanese facilities based on the “NKF-K/DOQI on Access care” programs
3. Structuring of care following algorithm notation method¹⁾
4. Feedback from clinical nurses regarding this structuring.

Results

From the literature review and web searches, we were able to gain an introduction to the education and teaching methods of each facility, but for the most part there was insufficient basis. From the clinical interviews it was found that expert nurses could deliver effective care through the use of educational media, but the thinking processes and nursing practice were not being recorded sufficiently and appropriate evaluation

could not be made, impeding the sharing of effective care and its general adoption. Established processes involved in care and evaluation were organized following the algorithm notation method¹⁾. As part of this, the essential vascular access sounds were put onto computer using an electrostethograph for continuous monitoring and recording of notes. The Vascular access management education program is made up of three sub-units. These are defined as “Action node” (8), “Thinking node” (4) and “choice node” (9) “Assessment item table” (6) and “Reference table” (8). From feedback from nurses involved, as a result of the application of the algorithm the thought and action process could be expressed in an organized way.

Conclusion

It is concluded that by recording and utilizing the Vascular access sounds in education, patients and nurses can both understand and appreciate the sounds, helping to achieve a better quality of patient education. Visualizing the thinking processes and nursing practice of expert nurses which have not been expressly stated previously can become a foundation for more advanced nursing care throughout the profession.

Reference

- [1] Tsuru S., Nakanishi M., Watanabe C. et al. 2005. Development of Programmed Care based on structural Visualization of Expert Nursing. Japanese Journal of Nursing Administration, Vol.17 (7) pp.555-561 (Japanese).
- [2] Tsuru S. et al. 2004. Standardization of Nursing Practice Terminology for Electric Health Record system in Health Care and Welfare service in Japan. Research report in grant from Japan Ministry of Health, Labor and Welfare, total 698 pages (Japanese)
- [3] NKF-K/DOQI Clinical Practice Guidelines : NKF-DOQI on Access Care, (2004). http://www.kidney.org/professionals/kdoqi/guidelines_updates/doqi_uptoc.html#va (accessed 2004-7-11)

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【要旨】透析患者の自己管理教育において、高度専門看護ケアが必要とされるシャント管理について、ケアの構造的可視化を行った。シャントの自己管理においてはシャント音の聴取とその記録が重要であり、音を電子媒体として取り入れながら教育するプログラムを作成した。シャント音を音のまま記録し、患者教育に活用することで、患者と看護師の間で音に関する共通の認識を促すことができ、よりよい患者教育の手助けとなると考えられた。これまで、明文化されることのなかったエキスパートナースの思考過程・看護実践を可視化することは、より高度なケアを多くの看護師が実践するための基盤となると考えられた。

【目的】透析患者教育領域において、明文化や理論背景に基づく系統的な説明がなされていないながらも、臨床で実際に行われている効果的な高度専門看護ケアを発掘し、そのケアの構造的可視化を行う。なかでも、高度なケアとされている血液透析患者へのシャント自己管理についてのプログラムを開発することを目的とする。

- 【方法】1. 文献検索・web 検索: pubmed, 医学中央雑誌, 検索サイト「 yahoo, MSN, goo, google, Infoseek, Excite」より検索。
2. 臨床の看護師からの聞き取り調査 (ヒアリング): 日本における透析導入患者数が年間 50 人以上の透析治療を行っている施設 2 施設の看護師 5 名に対し、文献検索・web 検索より得られた NKF-K/DOQI on Access care のケアプログラムもとにヒアリングを実施。
3. “看護管理文献” のアルゴリ

ズム表記法に従ったケアの構造化。

4. 臨床の看護師から、アルゴリズム化されたケアの結果についてヒアリング。

【結果】文献検索・web 検索により、各施設で行われている教育についての紹介はみられたが、その根拠については不十分であった。臨床看護師のヒアリングにおいては、エキスパートナースは教育媒体を工夫するなど効果的なケアを実施していたが、思考過程や看護実践の記録が十分になされていないことで適切な評価ができずにいることが分かり、そのため、効果的なケアの共有・一般化が妨げられていたことが分かった。そこで、根拠に基づいたケアと評価を含んだ思考過程を“看護管理文献”のアルゴリズム表記法に沿って、構造化を行った。構造化の過程において、必要不可欠なシャント音の観察については、電子聴診器を用いて、音をパーソナルコンピュータ上に取り込み、継続的な音の観察と記録を行えるように工夫した。

シャント管理教育プログラムのアルゴリズムは 3 つのサブユニットからなっ

いた(アルゴリズムの図参照)。表記された「行為ノード(node)」8件、「判断ノード」は4件、「判断分岐」9件であり。アセスメントシートは4シート、「参照シート」は8シートとなった。行為ノード、判断ノード、アセスメントシートの中には、シャント自己管理教育このアルゴリズム化された結果を現場のナースにヒアリングした結果、思考と行為のプロセスが整理されて表現されていることが分か

った。

【考察】シャント音を音のまま記録し、教育に活用することで、患者と看護師の間で音に関する共通の認識を促すことができ、よりよい患者教育の手助けとなると考えられた。これまで、明文化されることのなかったエキスパートナースの思考過程・看護実践を可視化することは、より高度なケアを多くの看護師が実践するための基盤となると考えられた。



Structural visualization of expert “*Vascular access*”

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nursing: Dialysis patient education program “*(VA) management*”

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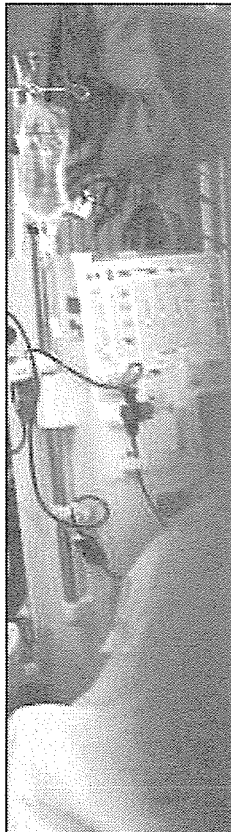
e The University of Tokyo, Tokyo, Japan



Opening summary

Structural visualization was implemented on vascular access management education for dialysis patients requiring expert nursing. As listening to and recording the sound of the Vascular access is important, an education program involving the electronic recording of sounds was proposed. Recording the Vascular access sounds and utilizing them as part of the education program encouraged a common understanding of the sounds between nurses and patients and helped to achieve a better quality of patient education. It is thought that visualization of nursing practice and the thinking processes of expert nurses which have not been expressly stated previously can become a foundation for more advanced nursing care throughout the profession.

Keywords: Patients education, Hemodialysis, Vascular access



Introduction

To seek out clinical examples of effective expert nursing in the field of dialysis patient education, which have nevertheless not been previously put into standard form or subjected to theory-based systematic exposition, on which to implement structural visualization. It aims to develop an education program for vascular access self-management in hemodialysis patients.

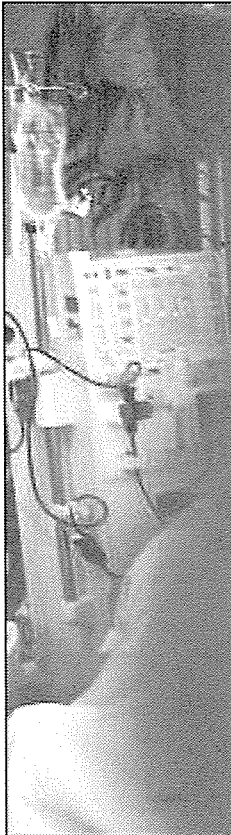
Methods

The literature review and web searches.

Interviews with five nursing professionals from two Japanese facilities based on the “NKF-K/DOQI on Access care” programs.

Structuring of care following algorithm notation method1).

Feedback from clinical nurses regarding this structuring.



Results

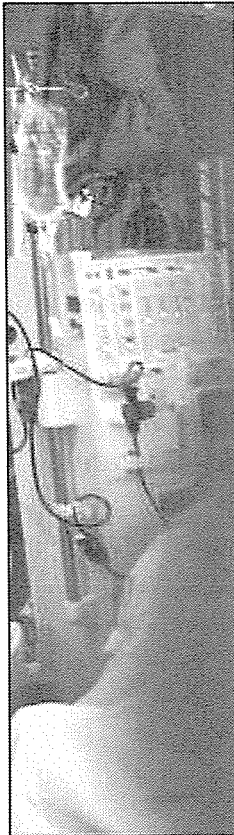
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Results

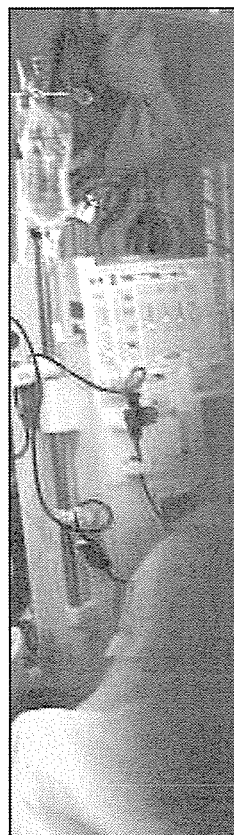
Established processes involved in care and evaluation were organized following the algorithm notation method¹). As part of this, the essential vascular access sounds were put onto computer using an electrostethograph for continuous monitoring and recording of notes.

The Vascular access management education program is made up of 4 sub-units. These are defined as "Action node" (8), "Thinking node" (4) and "choice node" (9). "Assessment item table" (6) and "Reference table" (8). From feedback from nurses involved, as a result of the application of the algorithm the thought and action process could be expressed in an organized way.



Conclusion

It is concluded that by recording and utilizing the Vascular access sounds in education, patients and nurses can both understand and appreciate the sounds, helping to achieve a better quality of patient education. Visualizing the thinking processes and nursing practice of expert nurses which have not been expressly stated previously can become a foundation for more advanced nursing care throughout the profession.



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1. Nursing intervention

1) Information for VA operation

- ① Confirmation of patient's understanding of the operation
- ② Orientation for operation

schedule, operating method, rest of VA arm, suture, protection of VA, how to listen to the VA, normal VA sounds, necessary items.

- ③ Acknowledge and listen to concerns and questions.

2) Post-operative care

- ① region of VA, anastomotic vessel diameter region where it is possible to listen to sound of VA, range of feeling at site
- ② Observation of wound (bleeding, redness, swelling at exit sites)
- ③ Compression of wound: how to roll gauze, fix tape, and bandaging; is there no bleeding
- ④ recording of VA sounds
- ⑤ Taking a picture of VA arm

→ Refer to VA sheet (figure 4)

Figure3.[R2]:Preoperative VA program

~Vascular Access sheet~

VA (fistula/graft), VA position (right/left) (upper arm / forearm)

| Date | bleeding | redness | swelling at exit site | BP Pre-Dialysis | BP Post-Dialysis | Weight Pre-dialysis | Weight post-dialysis | Blood flow | Nurse's signature |
|------|----------|---------|-----------------------|-----------------|------------------|---------------------|----------------------|------------|-------------------|
| / | | | | | | | | | |
| / | | | | | | | | | |
| / | | | | | | | | | |

Ex: electrostethograph

Artery side

→ <https://www.mma.co.jp/summa/c-4000.html>

Click to listen !

Figure 4.[R] VA sheet (graft)

Table2.[R4]: Intervention program 1 (graft)

| Nursing intervention | Outcome | Evaluation method |
|---|--------------------|---|
| Make <u>VA</u> sheet for nurse and patient to share information. → <u>refer to figure 4 [R]</u> Provide information | Can understand VA. | Oral questionnaire using checklist carried out to check patient's VA knowledge → <u>refer to Table 3[A3]</u> |

Table3.[A3]: Assessment of VA knowledge

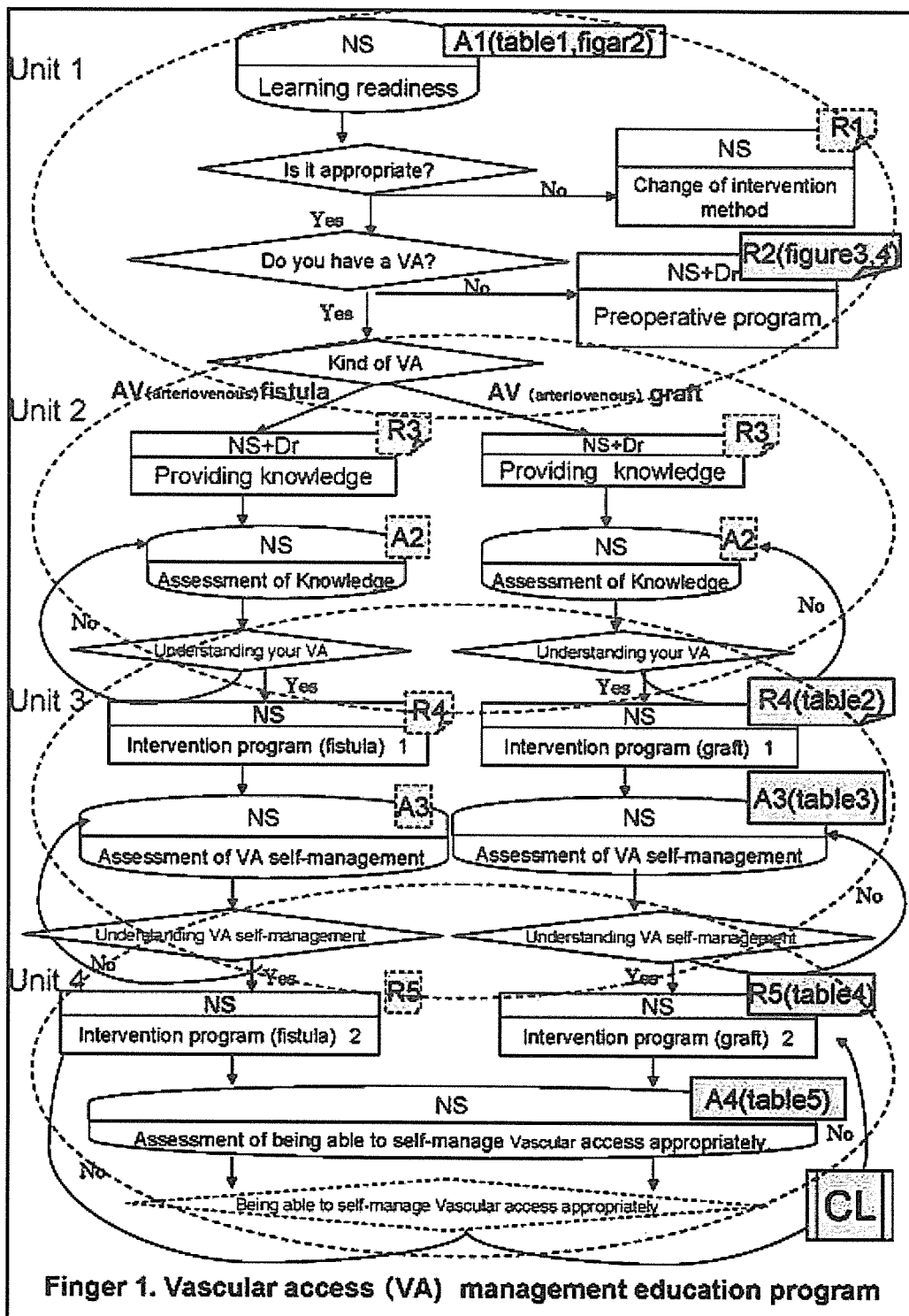
| Checklist | Questions | Date | Evaluation | Signature |
|---|--|------|------------|-----------|
| 1. Understand necessity for VA. | 1. Do you know what a VA is? | | | |
| 2. Understand and manage abnormal graft obstructions and infections. I. i) Understands cause of obstruction ii) Can give symptoms of obstruction iii) Can give measures against obstruction iv) Understands preventative measures for obstruction II. i) Understands cause of infection ii) Can give symptoms of infection iii) Can give measures against infection iv) Understands preventative measures for infection | 2. i) Do you understand when they occur? ii) Do you know what kinds of symptoms are shown? iii) If symptoms develop do you know what steps to take? iv) What prevention methods are there? | | | |

Table 4.[R5]: Intervention program 2 (graft)

| Nursing intervention | Outcome | Evaluation method |
|--|---|---|
| Provide information about methods of self-management. Demonstrate effective method via a model. (1) Hand-washing (2) Auscultation and palpation of VA (3) Points of caution at home (4) Response to abnormalities | Can explain self-management method. Understands occurrence of abnormalities. | Oral questionnaire using checklist carried out to check self-management knowledge. → refer to Table 5[A.4] |

Table5.[A4]: Assessment of Knowledge of VA

| Checklist | Questions | Date | Evaluation | Signature |
|--|--|------|------------|-----------|
| 3. Understands method, and can carry out daily observation. I .Listening to VA sound II .Observation of VA | I. Where do you listen to the VA? Please point to the place II. Where do you check the VA? What do you see? | | | |
| 4. Knows how to take off styptic cotton | How and when do you take off the styptic cotton? | | | |
| 5. Bleeding management understood I. Bleeding from the needle hole II. Internal bleeding | I. What should you do if bleeding from the needle hole? II. What should you do in the case of internal bleeding? | | | |
| 6. Can apply pressure to stop bleeding. | Do you know how to apply pressure to stop bleeding? | | | |



Finger 1. Vascular access (VA) management education program

Structural visualization of expert nursing: Dialysis patient education program “PD catheter management”

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Opening summary

Structural visualization was implemented on catheter management education for peritoneal dialysis (PD) patients requiring expert nursing. An education program utilizing electronic images was proposed as a method of monitoring the exit site which is of high importance in PD catheter self-management. Recording images of the exit site and utilizing them as part of the education program encouraged a common understanding of the exit site between nurses and patients and helped to achieve a better quality of patient education. It is thought that visualization of nursing practice and the thinking processes of expert nurses which have not been expressly stated previously can become a foundation for more advanced nursing care throughout the profession.

Keywords: Patients education, Peritoneal Dialysis, Catheter

Introduction

To seek out clinical examples of effective expert nursing in the field of dialysis patient education, which have nevertheless not been previously put into standard form or subjected to theory-based systematic exposition, on which to implement structural visualization. It aims to develop an education program for catheter self-management in PD patients.

Methods

1. The literature review and web searches.
2. Interviews with two nursing professionals. One representative of PD outpatient services, and one nurse representative from a catheter manufacturer.
3. Structuring of care following algorithm notation method¹⁾.
4. Feedback from clinical nurses regarding this structuring.

Results

From the literature review and web searches we were able to gain an introduction to the education and teaching methods of each facility, but for the most part there was insufficient basis. However, the PD catheter manufacturer's overseas pamphlet contained an account of a highly credible education program, and as a consequence during the interview the nurse was questioned about the suitability of the application of such a program in Japan. It was discovered the content of the care was expert and applicable. Expert nurses could adapt the educational media to a patient's individual situation and

deliver effective care, but the thinking process and nursing practice up to the implementation of care was not being recorded sufficiently and appropriate evaluation could not be made. In particular, it was shown that even if there was adequate observation of the exit site it was expressed in vague terms or did not show objectivity. In order to deliver continuous patient education the condition of the exit site skin should be shown us an image to ensure that the same information is shared visually.

The processes involved in this care and evaluation were organized following the algorithm notation method. The PD catheter management education program is made up of three sub-units. These are defined as “Action node” (6), “Thinking node” (4) and “choice node” (6). “Assessment item table” (6), and “Reference table” (4). From feedback from clinical nurses, the application of the algorithm allowed the thought and action process to be expressed in an organized way.

Conclusion

It is concluded that by putting images of the exit site onto PC, patients and nurses can both see and understand the skin's condition. Recording images of the exit site, where shared understanding was previously difficult, and visualizing the thinking processes of expert nurses which have not been expressly stated previously, can become a foundation for more advanced nursing care throughout the profession.

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【要旨】透析患者の自己管理教育において、高度専門看護ケアが必要とされる腹膜透析患者のカテーテル管理について、ケアの構造的可視化を行った。CAPD カテーテルの自己管理においては出口部管理が重要であり、その観察方法として、画像を電子媒体として取り入れて、教育するプログラムを考案した。カテーテル出口部の画像をそのまま記録し、教育に活用することで、患者と看護師の間で出口部に関する共通の認識を促すことができ、よりよい患者教育の手助けとなると考えられた。これまで、明文化されることのなかったエキスパートナースの思考過程・看護実践を可視化することは、より高度なケアを多くの看護師が実践するための基盤となると考えられた。

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- 【方法】
1. 文献検索・web 検索：
pubmed, 医学中央雑誌,
検索サイト「yahoo, MSN,
goo, google, Infoseek,
Excite」より検索。
 2. 看護師からのヒアリング
調査：日本において腹膜
透析治療を行っている施
設の腹膜透析外来担当の
看護師 1 名、および腹膜
透析カテーテル管理のパ
ンフレットを作成してい
るカテーテルメーカーの
担当者（看護師）2 名に
対し、ヒアリングを実施。

3. (看護管理文献) アルゴリズム表記法に従ったケアの構造化。

4. 臨床の看護師から、アルゴリズム化されたケアの結果についてヒアリング。

【結果】文献検索・web 検索により、各施設で行われている教育、指導方法についての紹介はみられたが、多くは、その根拠については不十分であった。しかしながら、腹膜透析カテーテルメーカー作成の海外用パンフレットには、その根拠が示されており、信頼性の高い教育プログラムであった。そのため、看護師へヒアリングにおいては、これらのプログラムが日本の現状に適応しているかどうかについて尋ねた。その結果、日本の腹膜透析患者の現状や看護体制により、指導の時期や場所に関しては異なる点があったが、ケアの内容については、活用できる高度専門ケアであることが分かった。また、エキスパートナースは教育媒体を患者の状態に合わせて工夫するなど効果的なケアを実施していたが、ケア実施までの思考過程や看護実践の記録が十分に