5巻1号
目　次

Vol. 5, No. 1
Contents

JNI　第五巻　第一号

平成十八年九月二十五日印刷
平成十八年九月三十日発行

発行所
徳島大学医学部
郵便番号七七〇―八五〇三
徳島市蔵本町

印刷所
㈱教育出版センター

研究報告

初回基礎看護学実習における学生の目標到達に対する自己評価と満足感との関連

近 藤 裕 子

徳島大学医学部保健学科

要 旨 次年度からの実習指導の一助とすることをめざし，A看護系大学1年生60名を対象に，初回基礎看護学実習における目標到達と満足感に関する自己評価を，5段階尺度で実施した．

学生の自己評価からは，6割の者が実習に満足感をもったと回答していた．実習目標への到達と実習の満足感との関連をみると,看護方式における役割や,患者の入院環境を既習の看護理論を用いて分析・考察する，さらに目的の明確化や目標到達への努力の有無が満足感に関連していた．この結果をふまえ教員は，学生に対し，実習目的・目標について十分に理解できるような説明や方法を考慮することや，批判的思考力の育成，さらに実習への関心や興味を強化できるような支援の重要性が示唆された．

キーワード：看護学生 初回基礎看護学実習 自己評価 目標到達 満足感

はじめに

教育を実施する上で，学生が科目内容や方法に興味・関心を示し，最終的に満足感を得て学習を終了できることは重要なことである．それは学習への動機づけとなり，さらには学生にその科目への期待を抱かせる一助となる．教員は，学生の興味・関心をいかに引きだすか，学生をどう動機づけるか，学生の満足感を高めるにはどのような支援ができるのかについて，継続して検討することは重要と考える．

臨地実習においても同様のことがいえる．しかし，看護学生の中には，臨地実習に関心を示さない者も多く見られるようになってきている．この要因としては，看護を志向していない，対人関係がうまく結べない，さらには，実習場で看護を志すのを中断するような出来事に遭遇した，などが考えられる．

臨地実習において教員は，学生を動機づけ，満足の高い実習を行うには，どのような支援をする必要があるのであろうか．先行研究においては，学生への動機づけに関しては，臨床場面からの分析[1)]や，教員との関わりの場面における分析[2)]などが行われている．一方，実習における満足感[3－7)]や学生がもつ困惑や困難[8)]，学生の自己評価からみた学習成果[9－10)]などからは，教員が学生をどのように支援するかについての課題が示されている．しかし，臨地実習における学生の自己評価と，満足感との関連についての先行研究は見あたらない．

今回，初回基礎看護学実習において，看護学生が目標にどの程度到達したか否かを，評価表に基づいて自己評価させた．学生の自己評価の結果と，学生の実習に対する満足度の程度を比較し，学生が満足感をもつには，学生をどう支援したらよいのかについて検討した．

目 的

次年度の実習指導の一助とするために，初回基礎看護学実習で学生が実施した自己評価から，目標到達と満足感の程度，およびそれらの関連を検討し，学生への支援のあり方を明らかにする．

2006年7月18日受付
2006年9月1日受理
別刷請求先：近藤裕子，〒770-8509 徳島市蔵本町3-18-15
徳島大学医学部保健学科

方　法

1．対象

A 看護系大学１年生で，2005年度開講の基礎看護学実習を受講した79人のうち，研究に承諾の得られた60人（75.9%）である．

2．期間

2005年９月開講の基礎看護学実習開始から終了後２週間までとした．

3．データ収集方法

実習終了日に，実習の７目標に実習に臨む姿勢や態度を加えた，30項目の細目標を設定し，到達度について５段階による学生自身の評価を実施した．

行動目標についての評価基準は，「到達できた」を５とし，「まあ到達できた」を４，「どちらともいえない」を３，「あまり到達できなかった」を２，「到達できなかった」を１とした．実習に対する満足感の評価基準は，「非常に満足である」を５とし，「満足である」を４，「どちらともいえない」を３，「あまり満足していない」を２，「全く満足していない」を１とした．

4．分析

目標到達への評価および満足感に関しての分析は，項目別に単純集計し，人数と百分率を算出した．その後，目標への到達基準の「到達できた」と「まあ到達できた」を「到達できた」とし，「どちらともいえない」はそのままで，「あまり到達できなかった」と「到達できなかった」を「到達できなかった」に３区分して，人数と百分率を算出した．さらに，目標到達と満足感との間で Spearman の順位相関係数を求め関連をみた．

5．倫理的配慮

学生には，調査の目的，調査内容と成績は無関係であること，プライバシーを守ること，拒否しても不利益を被らないこと，公表の是非について説明し，承諾を得た．

初回基礎看護学実習の概要

初回基礎看護学実習は，１年次９月に１週間病棟実習を行い，看護学概論で学習した知識を臨床の場で統合する科目として位置づけられている．学生は入学後から７月までに学習する看護学概論１単位（30時間）の内容，特に入院患者の生活環境や，看護活動の実施場面を観察し，ナイチンゲールやヘンダーソンの看護論を用いてクリティークし，看護についての学習を深めることを目的としている．

学生には目標として，①入院患者の生活環境の実態把握，②医療チームメンバーの各々の役割とメンバー間の連携のあり方，③医療チームにおける看護師の位置・役割，④看護活動についての説明，⑤ナイチンゲール，ヘンダーソンの概念モデルを比較照合資料として，入院患者の環境・健康・看護とそれらの関連について，⑥今後学習する科目の学習の必要性，⑦自己の興味・関心を持つ課題を探索する，の７目標を明示している．

学生は，１週間の実習期間中に目標到達できるように，事前・事後学習やグループ討論などの学習を行いながら，実習に臨んでいる．実習までに終了している科目は，共通教育科目の一部と，ボランティア論や保健学概論，介護実習，形態機能論の一部である．その他に専門科目としては看護学概論の科目が終了している．

結　果

看護学生の実習に対する満足感は，「非常に満足である」と回答した者は25名（41.7%），「満足である」は16名（26.7%），「どちらともいえない」の回答は11名（18.3%），「あまり満足していない」は７名（11.7%），「全く満足していない」と回答した者は１名（1.6%）であった（表１）．

学生の目標到達をみたのが表２である．30項目中60%以上の学生が「到達した」と回答した項目は25項目であった．その中で90%以上の学生が到達したと回答した項目は，患者の外的環境が把握できる（96.6%），病棟における看護師の業務を説明できる（93.3%），目標到達に努力できる（93.3%），看護の場に対して関心を示す（95.0%），丁寧な言葉遣いができる（91.7%），清潔な

表１　看護学生の実習に対する満足度の割合
n＝60

評　価　基　準	人（%）
非常に満足である	25（41.7）
満足である	16（26.7）
どちらともいえない	11（18.3）
あまり満足していない	7（11.7）
全く満足していない	1（ 1.6）

表2　看護学生の自己評価による目標到達割合

n=60　人（%）

目標	評価基準 / 評価項目	到達できた	どちらともいえない	到達できなかった
①患者の生活環境の把握	患者の外的環境が把握できる	58(96.6)	0(0.0)	2(3.3)
	患者の心理状態について把握できる	36(60.0)	19(31.7)	5(8.3)
	患者が生活する場としての環境を把握できる	53(88.3)	6(10.0)	1(1.6)
	治療・看護を受ける場としての環境を把握できる	45(75.0)	9(15.0)	6(10.0)
②チームメンバーの役割と連携	医療チームメンバーの職種と役割が分かる	46(76.6)	10(16.7)	4(6.7)
	医療チームの連携の方法を説明できる	41(68.3)	12(20.0)	7(11.7)
③④看護師の位置・役割，看護活動内容	病棟における看護師の業務を説明できる	56(93.3)	3(5.0)	1(1.6)
	職位別役割が分かる	45(75.0)	9(15.0)	6(10.0)
	看護方式とその中における役割を説明できる	45(75.0)	14(23.4)	1(1.6)
	病棟における特殊なケアについて分かる	35(58.4)	17(28.3)	8(13.3)
⑤理論との照合・分析	療養の場や環境と，既習の看護理論と照合できる	42(70.0)	13(21.7)	5(8.3)
	療養の場や環境を，既習の看護理論を用いて分析・考察できる	33(55.0)	22(36.7)	5(8.3)
⑥学習の必要性	既習の学習内容の復習の必要性が分かる	42(70.0)	16(26.7)	2(3.3)
	今後の学習の必要性が説明できる	53(88.3)	6(10.0)	1(1.6)
⑦課題の明確化	自己の課題が明確にできる	45(75.0)	14(23.4)	1(1.6)
	自己の課題内容の理由を説明できる	32(53.4)	23(38.3)	5(8.3)
	課題達成に向けた方法をあげる	23(38.3)	29(48.3)	8(13.3)
⑧実習に臨む姿勢 実習前	実習目的が明確化できる	52(86.7)	7(11.7)	1(1.6)
	グループにおける役割がとれる	46(76.6)	14(23.4)	0(0.0)
	グループで積極的，建設的に意見をのべる	48(80.0)	11(18.4)	1(1.6)
	事前学習ができる	46(76.6)	10(16.7)	4(6.7)
実習中	目標到達に向けた行動ができる	49(81.7)	10(16.7)	1(1.6)
	目標到達に努力できる	56(93.3)	4(6.7)	0(0.0)
	看護の場に対して関心を示す	57(95.0)	3(5.0)	0(0.0)
	丁寧な言葉遣いができる	55(91.7)	5(8.3)	0(0.0)
	清潔な服装ができる	55(91.7)	3(5.0)	2(3.3)
実習後	実習終了後、グループで積極的、建設的に意見をのべる	53(88.3)	7(11.7)	0(0.0)
	グループでのまとめに努力できる	57(95.0)	3(5.0)	0(0.0)
	発表・質疑に積極的に関わる	21(35.0)	23(38.3)	16(26.7)
	個人レポートが課題通り作成できる	43(71.6)	14(23.4)	3(5.0)

注）評価項目は目標ごとの細目標

表3　看護学生の実習に対する満足度と自己評価得点との相関

n=60

評価項目	Spearman の順位相関係数（r）
看護方式とその中における役割を説明できる	0.328 ＊
療養の場や環境と，既習の看護理論と照合できる	0.355 ＊
実習目的が明確化できる	0.315 ＊＊
目標到達に努力できる	0.314 ＊

＊　p<0.05
＊＊　p<0.01

服装ができる（91.7%），グループのまとめに努力できる（95.0%）であった．到達したと回答した学生が60%以下の項目は，病棟における特殊なケアについて分かる（58.4%），療養の場や環境を，既習の看護理論を用いて分析・考察できる（55.0%），自己の課題内容の理由を説明できる（53.4%），課題達成に向けた方法をあげる(38.3%)，発表・質疑に積極的に関わる（35.0%）の５項目であった．目標到達と満足度との間における相関をSpearman順位相関でみた．その結果，看護方式とその中における役割を説明できる（r=0.328, p<0.05），療養の場や環境と，既習の看護理論と照合できる（r=0.355, p<0.05），実習目的が明確化できる（r=0.315, p<0.01），目標到達に努力できる(r=0.314, p<0.05)の項目間で相関を認めた（表３）．

考　察

看護学生が意欲的に実習に臨むには，実習への動機づけや，実習に関する満足感がもてるように教員が支援することが重要となる．

初回基礎看護学実習において，学生の自己評価から目標到達をみると，この実習の目的とする看護の役割機能の一部や，入院患者の生活環境への理解については，目標到達にむけた努力の結果が現れている．しかし，既習の理論との照合・分析や，さらに自己の課題の明確化とその方法，発表・質疑などへの積極的な関わりについては，目標到達への割合が低い．

このことは，学生は入院患者の環境や看護師の活動内容を把握しようとしているものの，観察した内容の分析に困難をきたしているものと考える．これは学生の分析力や批判的思考力が，未だ十分に育成されていない状態であると判断できる．学生はたくさんの情報を収集しているが，それらをどのように収束するかの能力が十分でないと考えられる．今後教員は，学生の思考力を向上するような問いかけ，情報を収束する思考や分析について，指導していくことが重要である．

次に，学生の満足感の程度と目標到達との関連では，前述した項目と同様，看護の役割機能や既習の理論との照合・分析などの，目標到達と満足感が影響し合っている．さらに実習に臨んで実習目的を明確化できていたか否かや，目標到達への努力を行ったか否かが満足感と関連している．目標到達に向けては，個々の学生が努力していると観察できた．しかし，学生は，もう少し努力したらもっと満足いく実習ができたのではないかと考えているようだ．実習に対する自己評価による満足感と目標到達との関連から，実習の目的・目標を十分に理解させることと，実習場で何を目的として実習することが求められているかを，折に触れて学生に想起させながら実習に臨ませること，さらに学生の批判的思考力が向上するような支援の必要性が示唆された．

以上の結果を踏まえ，次年度から学生に対するよりきめ細かなオリエンテーションと，実習期間中は学生には必要に応じて目標想起させることと，目標への到達レベルを評価させながら実習を遂行していき，学生が満足のいく実習を体験でき，目標到達がはかられるように計画していきたいと考えている．

結　論

初回基礎看護学実習において，学生が自己評価した目標達成と満足感との関連を分析し，以下の事が明らかとなった．

1．初回基礎看護学実習に対して6割の学生は，満足であると回答していた．

2．実習に対する満足感と目標到達との関連では，看護方式の中における役割や，入院患者の生活の場や環境を既習の看護理論をもちいて分析・考察することについて，さらに目的の明確化や目標到達への努力の程度が満足感に影響していた．

学生が実習に積極的に取り組み，満足感をもって実習を行うために教員は，学生全員が実習目的・目標について理解し，学生の実習への関心や興味を強化できるような支援や，実習の期間を通して目標到達できるように，また思考力育成にむけた支援が重要である．

文　献

1）秋元典子，森本美智子，森恵子：看護への動機づけを促進する臨床実習の方法，Quality Nursing，10(8)，783-794，2004．

2）中村良美：臨床実習における教員の関わりと学生の経験－場面の再構成を通して，神奈川県立看護教育大学校看護教育研究集録，28，125-131，2003．

3）片山由美，奥津文子：臨地実習目標達成度評価と実習満足度との関連－学生の満足度を組み入れた臨地実習目標達成度評価の一考察，京都大学医療技術短期大学部紀要，23，33-42，2003．

4）北林司，矢嶋和江，秋山美香　他：成人看護学実習における看護学生の満足感を構成する要素の分析，群馬パース学園短期大学紀要，6(1)，21-27，2004．

5）高橋清美，中野榮子：学生が抱く早期看護実習Ⅰの主観的満足感－内発的動機づけによる実習効果，福岡県立大学看護学部紀要，1(1)，29-39，2003．

6）大森裕子：小児看護学実習における学生の満足感に及ぼす影響，大阪府立看護大学医療技術短期大学部紀要，8，73-77，2003．

7）岡本佐智子，長谷川真美，今川詢子　他：周手術期看護実習における意欲に関する要因－満足感・達成感・自己効力感実習のイメージからの分析，看護教育，42(8)，718-723，2001．

8）西田みゆき，北島靖子：小児看護実習における学生の困惑感，順天堂医療短期大学紀要，14，44-52，2003.
9）小口多美子，関美知代，吉村由起　他：小児看護学実習に於いて学生が直面する困惑，第33回日本看護学会論文集（小児看護），148-150，2003.
10）石原和子，松本麻里，岡田純也　他：内科治療領域における臨地実習の展開と学生による自己評価，長崎大学医学部保健学科紀要，14(2)，107-114，2001.

The relationship between self-assesment and satisfaction regarding goal attainment of students in initial basic practical training in nursing

Hiroko Kondo

Major in Nursing, School of Health Sciences, The University of Tokushima,Tokushima, Japan

Abstract　In order to provide an aid to practical training guidance starting next year, self-assessment using a 5-level scale was conducted regarding goal attainment and satisfaction in initial basic practical training in nursing, taking as subjects 60 first year students at Nursing University A.

In self-assessment, 60% of the students responded that they were satisfied with practical training. Looking at the relationship between attainment of practical training goals and satisfaction with practical training, satisfaction was found to be related to analysis and discussion of the patient hospitalization environment and the role in the nursing system using already studied nursing theory, and to clarification of purposes, and work to achieve goals.　These results suggest that instructors should consider explanations and methods which enable students to adequately understand the purposes/goals of practical training, and should provide support to develop critical thinking skills and further strengthen concern with and interest in practical training.

Key words：nursing student, initial basic practical training in nursing, self-assessment, attainment of practical training goals, satisfaction

RESEARCH REPORT

Analysis on "Role Lettering" applied to nurses who have entered their third year of working in hospital

Keiko Sekido

Major in Nursing, School of Health Sciences, The University of Tokushima, Tokushima, Japan

Abstract One of Role lettering methods, "Time-machine message", was applied to nurses who had entered their third year of working in hospital. As the result, writing down "Time-machine message" was useful for recognizing the problematic side of their inner selves and consequently for easing stress. Furthermore, it was found that the practice of this method was seen by them as an opportunity to reconsider their current situations and prospects. However, there were those nurses who could not concretely imagine themselves in the future, thus the necessity of support for such nurses was suggested.

Key words : role lettering, nurses, third year of working in hospital

Introduction

Nurses on duty in hospital are in a tense working environment in which they are always required not to make a mistake since their work relates to human life. In addition, although shortening of working hours and a five-day working week (two day-offs weekly) have permeated in Japan today, for nurses who are required to work on shift, improvement on their working condition is still regarded as an issue. Numerous occurrences such as fatigue, sign for mental anxiety, decline in the willingness for work, burnout and such are reported to have been experienced by the nurses under the above working condition[1−6]. Thereupon, it is considered that they need an opportunity to stop a little while to look back on and rethink about themselves.

As one of the methods for it to be achieved, survey to the nurse was conducted by using Role Lettering technique in this research. The name "Role Lettering" was a coined word inspired by the term "role-playing". In the method, one stands on both of the perspectives of "oneself" and "other", and by interchanging these two roles, both of the sides mutually communicate with each other by letter. Repetition of this mutual correspondence can lead one to recognize, in a form in which one can feel his/herself as considerate of the feeling and situation of "the other", his/her own inconsistency and dilemma in his/her inmost heart. This method is a psychological technique for the purpose of enhance one's own problem-solving abilities[7].

Role Lettering technique was firstly developed in the scene of correctional education, today it is widely used for instance in counseling and school education. However, there has been no report on the use of Role Lettering to a group of nurses who work ordinarily and do not show a particularly problematic situation. Nurses who are busy with enormous strain are assumed to be under stress even though it may not be apparent, thus some effects on them by applying Role Lettering are expected. Especially, nurses in their third year of duty in hospital are generally considered as being in one of the important stages in career ; it is the period of career in which their responsibility becomes more weighted than the

2006年 7 月19日受付
2006年 8 月21日受理
別刷請求先：關戸啓子, 〒770-8509 徳島市蔵本町 3 -18-15
徳島大学医学部保健学科

time when they were still new to the work[8], and their worries about the work increases. A quite large number of nurses consider for a change of job or going back to study in this period. Also in their private life, it is the time when nurses may start to think about marriage as well.

From the reasons above, the period can be thought as a turning point of life. Thereupon, in this research, one of Role Lettering methods "Time-machine message" is applied to nurses entering their third year of duty in hospital in order to examine what kind of effect may be observed.

Purpose

The aim of the present research was to clarify what kind of effect may be expected from applying Role Lettering technique to nurses.

Method

The subjects were 67 nurses who entered their third year of work in a general hospital with about 1000 beds. The purpose of this research was explained to them and the form for "Time-Machine Message" was distributed. The first half of the form was the space to write a letter "to myself in the future from myself in the present", and the last half space was to write a letter "from myself in the future to myself in the present". For entry on "Time-Machine Message", the subjects were asked "write a letter to 'yourself in the future' and then write a reply to that letter, acting as if you are the 'yourself in the future'". The content of the letter and the age of "the subject's self-in-the-future" were not confined. After "Time-Machine Message" was written, each of the subjects was asked to write his/her impression of the writing task, and the age and occupation of "the subject's-self-in-the-future". The subjects were informed in writing that the information obtained from the surveys was not to be used for any other purpose than for this research and was to be treated with sensitivity. It was conducted an anonymous survey. Also on inputting the data, it was encoded in order to prevent the subjects from being identified. The KJ method was employed for analysis.

Results

"Time-Machine Messages" were submitted from 50 of the subjects (the response rate of 74.6%). The number of the valid responses was 50 (the valid response rate of 100%).

1) The ages and occupations of "the subjects in the future" written in the letter.

The ages of the subjects in the present were 22 to 26 years old (22 Yrs Old : 7 subjects, 23 Yrs Old : 19 subjects, 24 Yrs Old : 13 subjects, 25 Yrs Old : 10 subjects, 26Yrs Old : 1 subject), and all of them were female.

For the ages of "the subjects in the future", the biggest number of 20 of the subjects entered 30 Yrs. old, and the second biggest number of 6 of the subjects entered 35 Yrs. old. Most of the other subjects entered the ages between the late 20s and 30s. Among the responses, one of the subjects wrote a letter to "the subject's self in the future" at the age of 80 Yrs. old (Refer to Table 1).

For the occupations of "the subjects in the future", the biggest number of 27 of the subjects entered "nurse", and the second biggest number of 9 of the subjects entered "housewife". Six of the subjects answered "unknown" as they could not think of it (Refer to Table 2).

Table 1 The chosen ages of "the subjects in the future" to whom the letters were written.

Age : No. of the subjects			
25 : 3	30 : 20	40 : 1	54 : 1
26 : 2	32 : 1	43 : 1	62 : 1
27 : 2	33 : 3	47 : 1	80 : 2
28 : 1	34 : 1		
29 : 1	35 : 6		Others : 3

Table 2 The chosen occupations of "the subjects in the future" to whom the letters were written

Occupation : No. of the subjects		
Nurse : 27	Unemployment : 4	Agriculture : 1
Housewife : 9	Service industry : 1	
Unknown : 6	Part-time worker : 1	Not answered : 1

2） The contents of “Time-Machine Message”

The written contents of “Time-Machine Messages” were analyzed by employing the KJ method and the results are shown in Table 3.

(1) The group of the subjects who wrote questions to “themselves in the future” (Refer to Table 4).

The most written questions were : “what do you do?” (n=14), “do you enjoy everyday life?” (n=9), “do you still work as a nurse?” (n=4), “how are you?” (n=4), “have you grown up?” (n=4), “are you happy?” (n=4) and so on.

Towards those questions, the replying messages from the future were : “have a positive view on what you do, hang in there” (n=10), “it may be a difficult time, but once you overcome it then your work will be enjoyable” (n=5) and so on.

(2) The group of the subjects who wrote wishes to “themselves in the future” (Refer to Table 5).

The most written wishes were : “I hope you are working hard and energetically” (n=4), “I hope you have a happy home” (n=3), “I hope you are doing what you want” (n=3), “I hope you are living a full life everyday” (n=3) and so on.

To those, the replying messages from the future were: “take things positively and hang in there” (n＝10), “you may feel difficult from time to time, but it will be a good memory, so take it easy” (n=3) and so on.

(3) The group of the subjects who reported their present situations to “themselves in the future” (Refer to Table 6).

The written situations were the followings : “despite of all difficulties, I am glad that I have become a nurse” (n=3), “I am not sure what I really want to do” (n=2), “I am not confident in myself” (n=2), “I am too often worried about something” (n=2), and so on.

Table 3 The contents of “Time-Machine Messages”

1． The group of the subjects who wrote questions to “themselves in the future.”
2． The group of the subjects who wrote wishes to “themselves in the future.”
3． The group of the subjects who reported their present situations to “themselves in the future.”

Table 4 The contents of “Time-Machine Messages”
－The group of the subjects who wrote questions to “themselves in the future”－

From the subjects in the present to “themselves in the future” →	← From the subjects in the future to “themselves in the present”
・What do you do ? (14 of the subjects)	・Have a positive view on what you do, hang in there. (10)
・Do you enjoy everyday life ? (9)	・It may be a difficult time, but once you overcome it then your work will be enjoyable. (5)
・Do you still work as a nurse ? (4)	・Don't give up, hang in there. (3)
・How are you ? (4)	・I am thankful for my past. (2)
・Have you grown up ? (4)	・The work is more enjoyable now than it used to be.
・Are you happy ? (4)	・Now I am on a different job and I am more optimistic.
・Have you become the kind of nurse you wanted ? (2)	・Enjoy your youth while you can.
・Have you taken any action for yourself ? (2)	・You should have done more study.
・Have you found what you really want do ? (2)	・Gain advices from many different people.
・Have you grown up mentally ?	・Do your best for your future.
・Do you work hard ?	
・Do you live a full life ?	
・What kind of things do you think of ?	
・What I am now is not wrong, am I ?	
・Are there more difficulties than pleasures from now on in my life ?	
・Do you try hard ?	
・Are you kind to patients and the colleagues ?	
・Do you have confidence in yourself ?	
・Do you work energetically ?	
・Have you got married ?	

To those letters, the replying messages from the future were : "consider the present importantly" (n=1), "hang in there little by little" (n=1), "I feel that things are better now than they used to be" (n=1) and so on.

Table 5 The contents of "Time-Machine Messages"
—The group of the subjects who wrote wishes to "themselves in the future"—

From the subjects in the present to "themselves in the future" →	← From the subjects in the future to "themselves in the present"
・I hope you are working hard and energetically. (4 of the subjects)	・Take things positively, and hang in there. (10)
・I hope you have a happy home. (3)	・You may feel difficult from time to time, but it will be a good memory, so take it easy. (3)
・I hope you are doing what you want. (3)	・You may be in the most difficult time of your life, but hang in there. (2)
・I hope you are living a full life everyday. (3)	・Please take firm steps one by one for your life. (2)
・I hope you enjoy working. (2)	・For the moment, you should think a lot and deeply.
・I hope you have become wonderful. (2)	・You are doing your best.
・Please be an excellent nurse. (2)	・Please act on things calmly.
・I hope you have a boarder outlook than what I have now.	・Let me remind you that communication is important.
・I think you are busier than I am now.	・Please be thankful to people around you.
・Please do the work of nursing with the feeling of happiness in what you do.	
・I hope you are brightened up with joy.	
・Even in a difficult time, please don't be hard on other people.	
・I want you to be what you want to be.	
・I want you to be free.	
・Please be able to make full use of bitter experiences for other chances.	
・Don't try too hard, take a rest when you are tired.	
・Please be kind to younger colleagues and newcomers.	
・Please live happily.	
・Please do your work as well as study.	
・Please continue your job as a nurse.	

Table 6 The contents of "Time Machine Messages"
—The group of the subjects who reported their present situations to "themselves in the future"—

From the subjects in the present to "themselves in the future" →	← From the subjects in the future to "themselves in the present"
・Despite of all difficulties, I am glad that I have become a nurse. (3 of the subjects)	・Consider the present importantly.
・I am not sure what I really want to do. (2)	・Hang in there little by little.
・I am not confident in myself. (2)	・I feel that things are better now than they used to be.
・I am too often worried about something. (2)	・I am very much satisfied with what I am.
・I feel mentally tired.	・I am doing what I want to do.
・I am busy.	・Take courage on what you do.
・Nowadays I feel painful and do not enjoy everyday life.	
・I don't really feel that I am happy.	
・My feeling is not stable from time to time, and my attitude toward work reflects on it.	
・I am worried about my future as I am not confident in what I do.	
・I am full of anxiety and expectation.	
・Although I feel stress often, I find funs also.	
・I am doing my best not to make you (the subject's self-in-the-future) regret the past.	
・I am trying hard to be a nurse whom people can trust.	

Table 7 The impressions of the subjects after writing "Time-Machine Message"

- It was difficult to imagine myself in the future. (12 of the subjects)
- It was a good opportunity to look back on myself in an objective way and consequently to remind myself of my own dream. (10)
- I feel better as it led to encourage myself. (5)
- I realized my own anxiety, worry and cause for stress. (4)
- It was enjoyable to write. (4)
- Now I can see an objective worth trying hard. (4)
- It was a good opportunity to think about my future. (4)
- Now I can gradually see what to do for my future. (2)
- I was able to wrote as I wished. (2)
- It is good if my future will turn out to be what I wrote. (2)
- I became worried about my future.
- Though I am worried much now, I will think about my future carefully before I make an action.

3) The impressions of the subjects after writing "Time-Machine Message"

The most written contents by the subjects were the followings: "it was difficult to imagine myself in the future" (n=12), "it was a good opportunity to look back on myself in an objective way and consequently to remind myself of my own dream" (n=10), "I feel better as it led to encourage myself" (n=5), "I realized my own anxiety, worry and cause for stress" (n=4), "It was enjoyable to write" (n=4), "now I can see an objective worth trying hard" (n=4), "it was a good opportunity to think about my future" (n=4) and so on (Refer to Table 7).

Discussion

Probably due to the fact that most of the nurses who participated in this research as the subjects were in their early twenties, they chose to write a letter to themselves-in-the-not-so-far-future whose ages were mostly 30 and 35. Because of this, about the half of the subjects imagined their occupations in the future as a nurse and that they-in-the-future would continue the work which they-in-the-present are actually at.

The contents of "Time-Machine Message" were divided into three groups: 1) "the questions", 2) "the wishes", and 3) "the reports of their present situations". First, in the group of "the questions", the nurses were at the age of a crossroads in their lives, and probably due to this, many of their letters were on questioning what they-in-the-future were doing. To those letters, they-in-the-future replied, "I am happy with the situation I am in. So although it is a difficult time for you, hang in there!" Then, in the group of "the wishes", the nurses wrote the lifestyles of their dreams they would like to possess in future. In the replies, messages of encouragement toward fulfilling their wishes were sent by themselves-in-the-future. Lastly, in the group of "the reports of their present situations", the nurses' worries and lack of confidence were written honestly to themselves-in-the-future. In the replies, they-in-the-future wrote to let themselves-in-the-present know that they-in-the-future overcame the difficulties which they-in-the-present were dealing with.

As the above shows, positive and encouraging messages were returned from themselves-in-the-future to all of the three groups. Also, from the impressions of the nurses on "Time-Machine Message", it can be inferred that "Time-Machine Message" was helpful in easing stress of the nurses. For instance, some of the nurses were able to feel more energetic and some found causes of their stress.

In the concept of "Time-Machine Message", the subject-in-the-future, who has overcome the problematic situation that the subject-in-the-present is in, writes a letter to the subject-in-the-present. Accordingly, the subject is able to see him/herself calmly in an objective way and give an advice to his/herself. That is how it can demonstrate the effect of that one can realize the nature of his/her own problem.

In the analysis of the most given impression "it was difficult to imagine myself in future", the current situation of the nurses can't afford to think about their future and dream as they are swamped with work. The third year of the

nurse duty in hospital is the time when third-year nurses start guiding younger nurses and making nursing judgments on their own[8]. It is a transition period from the self who can be dependent on the older nurses to the new self who is independent as a professional nurse, therefore it is apparent that third year nurses feel the need to work as hard as possible. For nurses like them, it is necessary from time to time to organize an opportunity like "Time-Machine Message" to stop for a while and think about their future.

In addition, a quite large number of subjects reported that "'Time-Machine Message' was a good opportunity which learned about my-self from a new perspective and to rethink about my future". This is because the nurses' dreams of future they had been thinking vaguely were clarified within the nurses' selves by putting down the dreams in words in the form of letter. It is an evidence of the effect of "Time-Machine Message" by which the nurses were enabled to clarify their future objectives.

Conclusion

These results suggest that the application of "Role Lettering" to the nurses is usefulness in easing their stress by receiving advices from themselves-in-the-future. Also, writing "Time-Machine Message" is found to be an opportunity for the nurses to look back on themselves and to consider their desirable prospective situations. On the other hand, some of the nurses reported that they were so preoccupied in their present situations that they could not concretely imagine themselves-in-the-future when they wrote "Time-Machine Message". For nurses like them, a support such as a number of "Time-Machine Message" exercises may be necessary. In future research, I would like to develop techniques and strategies for Role Lettering as a support technique for nurses as individuals.

References

1) Sato K, Amano A : Investigation of relation between working conditions and accumulative fatigue in nurses. Journal of Oita Nursing and Health Sciences 2(1) : 1-7, 2000 (in Japanese with English abstract)

2) Ohara M, Maruguchi M, Nishio K, et al : Research on nurse's retention possibility. J Nurs Studies N C N J3(1) : 75-82, 2004 (in Japanese with English abstract)

3) Masamura K : Relationship between the perception of work-related stress by nurses and their family composition in Japan : Analysis according to hospital size. Medicine and Biology 150(1) : 33-51, 2006

4) Masamura K, Kakeda T, Ichihara K, et al : Factors that influence nurses' perceptions of work-related stress in Japan : Analysis according to hospital size. Medicine and Biology 150(5) : 197-215, 2006

5) Tounai M:Relationship between distribution of time and recognition for life and fatigue by nurse : Difference due to working woman and teachers. Journal of Japanese Society of Nursing Research 27(4) : 17-24, 2004 (in Japanese with English abstract)

6) Suzuki E, Kanoya Y, Kitaoka-Higashiguchi K, et al : Workplace environment, assertiveness and burnout risk among novice nurses in university hospitals. Journal of Japanese Society of Nursing Research 28 (2) : 89-99, 2005 (in Japanese with English abstract)

7) Harano Y : Role lettering therapy : A new transactional analysis technique from Japan. Transactional Analysis Journal (July) : 254-259, 2005

8) Sano A, Hirai S, Yamaguchi K : Research on lead nurses' work motivation : Analysis of role stress perception and other related factors. Journal of Japanese Society of Nursing Research 29(2) : 81-93, 2006 (in Japanese with English abstract)

RESEARCH REPORT

Factors associated with the discontinuation of breastfeeding until 3 months after delivery

Mari Haku, Keiko Takebayashi, and Toshiko Tomiyasu
Graduate Course of Midwifery, The University of Tokushima, Tokushima, Japan

Abstract **Study Purpose** : The purpose of this study was to calculate the degree of the influences of factors affecting the discontinuation of breastfeeding until 1 month after delivery on that until 3 months after delivery, and to identify indicators of the discontinuation of breastfeeding until 3 months.

Methods : The subjects were 60 mothers who delivered a single infant and initiated breastfeeding in an early puerperal stage after full-term vaginal delivery.

As possible indicators of breastfeeding until 3 months after delivery, 3 breast morphological factor variables ("nipple morphological abnormalities : flat nipples, true inverted nipples, and large nipples ≥17 mm in diameter", "nipple fissures", and "mammary gland tissue thickness ≤21 mm") and 5 factors (bleeding volume at delivery, birth weight, the absence of breastfeeding in the last child, a smoking habit, and the absence of breastfeeding at discharge) were surveyed.

The 8 factors were surveyed at the time of puerperal discharge. The continuation of breastfeeding 3 months after delivery was ascertained by telephone.

The degree of the influences of each factor on the milk feeding form was analyzed by Fisher's exact method and logistic regression analysis.

Results and conclusion

Factors affecting the milk feeding form 3 months after delivery

Among the 8 possible factors leading to the discontinuation of breastfeeding, the absence of breastfeeding at discharge (Fisher p＝0.003) alone compared with its presence resulted in mixed/ bottlefeeding 3 months after delivery. The odds ratio of each factor in the mother/child was 1.931 for the thickness of mammary gland tissue, 1.677 for bleeding volume at delivery, 2.502 for the absence of breastfeeding in the last child, and 7.337 for the absence of breastfeeding at discharge. By logistic regression analysis, only the absence of breastfeeding at discharge was correlated with mixed/bottlefeeding 3 months after delivery (odds ratio, 7.337 ; p＝0.017).

These results suggest that the absence of breastfeeding at discharge is an indicator of the discontinuation of breastfeeding until 3 months after delivery.

Key words : *basic conditioning* factors, breastfeeding, 3 months after delivery, limitation factors

2006年 7 月18日受付
2006年 9 月 7 日受理
別刷請求先：葉久真理, 〒770-8509 徳島市蔵本町 3 -18-15
徳島大学助産学専攻科

Introduction

The purpose of this study was to calculate the degree of the influences of factors affecting the discontinuation of breastfeeding until 1 month after delivery (Haku2005)[1] on that until 3 months after delivery, and to identify indicators of the discontinuation of breastfeeding until 3 months.

Breastfeeding, with many advantages for the mother and child, has been universally promoted. There have been various studies on the continuation of breastfeeding. Previous studies on mother's milk and breastfeeding can be classified into"surveys of physical/psychological/social factors inhibiting the continuation of breastfeeding"[2-6], "clarification of the structure and function of the breast and mammary gland"[7,8], "studies on scientific/psychosocial advantages of mother's milk"[9], "evaluation of the effectiveness of care for breastfeeding"[10-13], and "development of scales associated with breastfeeding"[14-16].

Based on these previous studies, Haku (2003[17], 2005[1]) surveyed factors leading to the limitation factors of breastfeeding in terms of psychological/social factors, breast morphological factors, and *basic conditioning* factors, and clarified 22 items in the 3 categories of breastfeeding.

We surveyed and analyzed psychological/social factors leading to the discontinuation of breastfeeding before 3 months after delivery using a questionnaire. As a result, 13 items of 4 factor models ("lack of knowledge/experience", "lack of leisure time", "lack of eagerness for breastfeeding", and "lack of adequate awareness of lactation") were associated with the discontinuation of breastfeeding before 1 month after delivery. In this study, though we asked the subjects to answer a questionnaire, its recovery rate was low. Therefore, analysis using these factors was avoided.

Concerning breast morphological factors, 70-80% of the subjects with nipple morphological abnormalities (flat nipples, true inverted nipples, and large nipples ≥17 mm in diameter) or nipple fissures were using mixed/bottlefeeding 1 month after delivery. The thickness of mammary gland tissue significantly differed between the breastfeeding group and mixed/bottlefeeding group. The mean thickness of mammary gland tissue at discharge in all subjects was 21.3±5.3 mm. According to the feeding method, the thickness of mammary gland tissue 1 month after delivery was 22.4±5.3 mm in the breastfeeding group and 20.2±5.0 mm in the mixed/bottlefeeding group, showing a significant difference between the two groups ($t=2.14$, $p=0.035$). Based on these results, the cut-off point of the thickness of mammary gland tissue was determined to be 21 mm based on the similarity between the sensivity and specificity and the mean value of 21.3 mm in all the subjects, and the thickness was analyzed as a possible factor of the discontinuation of breastfeeding.

As basic conditioning factors, those reported[6,8] to affect breastfeeding in the literature were statistically analyzed. As a result, 5 possible basic conditioning factors of the discontinuation of breastfeeding (bleeding volume at delivery ≥500 ml, birth weight<2,500g, the absence of breastfeeding in the last child, the absence of breastfeeding at discharge, and a smoking habit) were analyzed.

In this study, based on the above results, we calculated the degree of the influences of the breast morphological factors and basic conditioning factors (8 factors in the 2 categories) as possible indicators of the discontinuation of breastfeeding on the milk feeding form.

Methods

1) Survey methods

As possible indicators of the discontinuation of breastfeeding until 3 months after delivery, 3 breast morphological factor variables ("nipple morphological abnormalities : flat nipples, true inverted nipples, and large nipples ≥17 mm in diameter", "nipple fissures", and "mammary gland tissue thickness ≤21mm") and 5 *basic conditioning* factors (bleeding volume at delivery, birth weight, the absence of breastfeeding in the last child, a smoking habit, and the absence of breastfeeding at discharge) were surveyed.

The 8 factors were surveyed at the time of puerperal discharge. The continuation of breastfeeding 3 months

after delivery was ascertained by telephone.

The thickness of mammary gland tissue was measured on the lateral side of the breast centering on the nipple contralateral to the dominant arm using an ultrasonic diagnostic system (LP probe at 7.5 MHz) (RT-FINO, Yokogawa Medical, Tokyo, Japan) after breast-feeding on the day before discharge (4 or 5 days after delivery). The nipple state was evaluated by observation and measurement.

Data on the 3 *basic conditioning* factors (bleeding volume at delivery, birth weight, and the absence of breastfeeding at discharge) were obtained from delivery records, and data on the absence of breastfeeding in the last child and the smoking habit were obtained by an interview of the subjects.

2) Analysis method

For the analysis of the influences of each factor on the breastfeeding form at 3 month after delivery, significant differences were evaluated by Fisher's exact method and the χ^2 method. In addition, the degree of the influences of the factors as a whole was calculated by logistic regression analysis using the milk feeding form at 3 months after delivery as explanatory variables and the 5 possible factors of the discontinuation of breastfeeding as independent variables.

3) Subjects of survey

The subjects were 60 mothers who delivered a single infant and initiated breastfeeding in an early puerperal stage after full-term vaginal delivery.

4) Survey institution

This survey was performed in an institution in a local city where the annual number of deliveries is about 400, and the WHO's "Ten Steps to Successful Breastfeeding" are performed.

5) Survey period

Between April 2004 and January 2005

6) Ethical considerations

Researchers gave both oral and written explanations of the study to individual subjects and requested cooperation in the study, telling them that obtained information would be strictly stored and managed, individual subjects would not be identified, and the presence or absence of consent would not affect subsequent care. The approval of the ethical committee of the research institution for this study was obtained.

Results

1) Characteristics of subjects (Table 1)

The mean age of the subjects was 30.9±4.7 years (Range 19-41), which was about 1-year higher than the mean delivery age of mothers in Japan in fiscal 2002 (29.8 years) [21]. Thirty-two mothers (53.3%) did not have childcare experience, while 28 mothers (46.7%) had such experience.

Nipple morphological abnormalities were observed in 3 mothers (5.0%), nipple fissures in 7 mothers (11.7%), and a mammary gland thickness ≤21 mm in 33 mothers (55.0%).

Bleeding volume at delivery ≥500 ml was observed in 19 mothers (31.7%), birth weight<2,500 g in 3 mothers (5.0%), the absence of breastfeeding in the last child in 18 mothers (30.0%), a smoking habit in 4 mothers (6.7%), and the absence of breastfeeding at discharge in 17

Table 1 Characteristics of subject (n=60)

Age (Mean±SD)	30.9±4.7years
Childcareing Without childcare experience With childcare experience	32cases(53.3%) 28cases(46.7%)
Abnormalities of the nipple	3cases(5.0%)
Nipple fissures	7cases(11.7%)
Mammary gland tissue at discharge : ≦21mm	33cases(55.0%)
Bleeding volume : ≧500ml	19cases(31.7%)
Birth weight : <2500g	3cases(5.0%)
Absence of breastfeeding in the last child	18cases(30.0%)
Smoking habit	4cases(6.7%)
Absence of breastfeeding at discharge	17cases(28.3%)
1 month after delivery Breastfeeding Mixed/Bottlefeeding	33cases(55.0%) 27cases(45.0%)
3 month after delivery Breastfeeding Mixed/Bottlefeeding	26cases(43.3%) 34cases(56.7%)

mothers (28.3%).

One month after delivery, the breastfeeding group consisted of 33 mothers (55.0%), and the mixed/bottlefeeding group consisted of 27mothers (45.0%). Three months after delivery, the breastfeeding group consisted of 26 mothers (43.3%), and the mixed/bottlefeeding group consisted of 34 mothers (56.7%).

2) Factors at discharge affecting the breastfeeding form 3 months after delivery (Table 2, Table 3)

Among the 8 possible factors of the discontinuation of breastfeeding, only the absence of breastfeeding at discharge (Fisher p=0.003) compared with its presence resulted in mixed/bottlefeeding 3 months after delivery.

The degree of influences was analyzed by logistic regression analysis using the milk feeding form (breastfeeding, 0; mixed feeding, 1) 3 months after delivery as explanatory variables and 5 maternal/child factors after excluding factors showing a few cases (nipple morphological abnormalities, birth weight, and the smoking habit) as independent variables. The odds ratio of each factor in the mother/child was 1.931 for the thickness of

Table 2 The degree of the influence of each factors (Fisher) n=60

	3 month after delivery		χ^2	p
	Breastfeeding	Mixed/ Bottlefeeding		
Normalities of the nipple	26	31		Fisher 0.175
Abnormalities of the nipple	0	3		
Non Nipple fissures	25	28		Fisher 0.104
Nipple fissures	1	6		
Mammary gland tissue at discharge >21mm	15	12	2.98	0.084
Mammary gland tissue at discharge ≦21mm	11	22		
Bleeding volume <500ml	19	22	0.47	0.490
Bleeding volume ≧500ml	7	12		
Birth weight ≧2500g	25	32		Fisher 0.601
Birth weight <2500g	1	2		
Breastfeeding in the last child	21	21		Fisher 0.095
Absence of breastfeeding in the last child	5	13		
Non Smoking habit	26	30		Fisher 0.095
Smoking habit	0	4		
Breastfeeding at discharge	24	20		Fisher 0.003*
Absence of breastfeeding at discharge	2	14		

*p<0.01

Table 3 The degree of the influence of each factors (logistic regression analysis) n=60

	Odds ratio	95%C.I	*p*
Mammary gland tissue at discharge ≦21mm	1.931	0.609-6.123	0.264
Bleeding volume ≧500ml	1.677	0.471-5.966	0.425
Absence of breastfeeding in the last child	2.502	0.663-9.438	0.176
Absence of breastfeeding at discharge	7.337	1.437-37.453	0.017*

*p<0.05

mammary gland tissue, 1.677 for bleeding volume at delivery, 2.502 for the absence of breastfeeding in the last child, and 7.337 for the absence of breastfeeding at discharge. By logistic regression analysis, only the absence of breastfeeding at discharge (odds ratio, 7.337; $p=0.017$) was correlated with mixed/bottlefeeding 3 months after delivery.

Discussion

The infant nutritional statistics in fiscal 2005 showed a breastfeeding rate of 42.3% and a mixed/bottlefeeding rate of 57.6 % 1 month after delivery and a breastfeeding rate of 38.0% and a mixed/bottlefeeding rate of 62.0% 3 months after delivery. The breastfeeding rates 1 month and 3 months after delivery in this study were 55.0% (33 mothers) and 43.3% (26 mothers), respectively, being higher than those in the 2005 statistics.

Of the 3 breast morphological factor variables and 5 *basic conditioning* factors, only "the absence of breastfeeding at discharge" was a factor affecting breastfeeding until 3 months after delivery. "Ten Steps to Successful Breastfeeding"[9] proposed that childcare only by breastfeeding during hospitalization is important. Our results suggest that this article is associated with breastfeeding until 3 months after birth.

Other factoes, bleeding volume at delivery and the thickness of mammary gland tissue to be associated with breast milk secretion, there became little influence with the temporal course. Nipple fissures and abnormalities of the nipple were improved or when with a little influence, it is thought by improvement of a breastfeeding action. However, by this study, only the person who was a breastfeeding is not investigated in 1 month after delivery. Therefore other factors cannot judge when influence decreased since.

Care during the short period from delivery to discharge may be the key for the continuation of breastfeeding. Practical care to increase mothers' confidence[3] in breastfeeding may be important. Mothers' feeling of breastfeeding being burdensome may be reduced not only by enhancing the eagerness for and positive view of breastfeeding, but also by care to adequately increase awareness of lactation. For this, not only the efforts of caregivers but also mothers' self-care is important. For the continuation of breastfeeding, mothers and their families and expert care providers should understand breastfeeding discontinuation factors and make efforts to eliminate or reduce these factors during the pregnancy/delivery/puerperal periods.

The infant nutritional statistics in fiscal 2005 reported by the Ministry of Health, Labour and Welfare showed a gradual decrease in bottlefeeding. A survey of the practice status of the WHO's "Ten Steps to Successful Breastfeeding" showed low practice rates ("placement of the mother and child in the same room from immediately after delivery", 17%; "breastfeeding within 30 minutes after delivery", 32%; "breastfeeding whenever the infant wishes", 53%) and necessity for an increase in support in delivery institutions.

In the future, further surveys of the effectiveness of care during puerperal hospitalization are necessary.

Conclusion

The results of this study suggest that the absence of breastfeeding at discharge is an indicator of the discontinuation of breastfeeding until 3 months after delivery.

References

1) Haku M, Ohashi K: Analysis of basic conditioning factors in the mother/child affecting breast-feeding, The Journal of Nursing Investigation 4(1): 15-20, 2005

2) Amir, LH, Donath, SM: Does maternal smoking have a negative physiological effect on breastfeeding ? The epidemiological evidence, Birth 29(2): 112-123, 2002

3) Blyth, R, Creedy DK, Dennis CL, Mooly W, et al.: Effect of maternal confidence on breastfeeding duration: An application of breastfeeding self-efficacy theory. Birth 29(4): 278-284, 2002

4) Colin WB, Jane AS: Breastfeeding: Reasons for starting, reasons for stopping and problems along the way, Breastfeeding Review 10(2): 13-19, 2002

5) Shimada M,Watabe N, Kamiya S, et al. : A national survey about anxiety of the mother and child and child care support needs during one month after delivery, Shoni Hoken Kenkyu 60(5) : 671-679, 2001
6) Taketani Y, Mizuno M : Factors of milk secretion after birth. Obstet Gynecol 36 : 149-154, 1986
7) Hill PD, Jean A : Potential Indicators of Insufficient Milk Supply Syndrome. Research in Nursing & Health 14 : 11-19, 1991
8) Taketani Y : Puerperium : Mammary change and lactation, Comprehensive Handbook of Women's Medicine, Nakayama-Shoten, Tokyo, 2001, pp. 27-37
9) UNICEF/WHO/Hashimoto T : Breastfeeding Management and Promotion in a Baby-Friendly Hospital. : Igakusyoin, Tokyo 2003, pp. 20-106,
10) Coreil J, Brtant C, Westover B, Bailey D : Health professional and breastfeeding counseling, Journal of Human Lactation 11 : 265-271, 1995
11) Nezu Y, Hama M : The change of breast-feeding guidance method, Obstetrical and Gynecological Therapy 73(4) : 374-379, 1996
12) Shimada M,Watabe N, Toda R, et al. : Connection with breast-feeding care and maternal feeding establishment during hospitalization, A national survey about breast-feeding, Shoni Hoken Kenkyu 60(6) : 749-756, 2001
13) Ortiz J, Mcgilligank K, Kelly P : Duration of breast milk expression among working mothers enrolled in an employer-sponsered lactation program, Pediatric Nursing 30(2) : 111-119. 2004
14) Dennis CL : The breastfeeding self-efficacy scale, psychometric assessment of the short form. Journal Obstetric Gynecol Neonatal Nursing 32(6) : 734-744, 2003
15) Haku M, Ohashi K : Evaluation of the breast-feeding limitation scale as a useful tool for prediction of continuing breast-feeding, The Journal of Nursing Investigation 3 (1) : 27-34, 2004
16) Janke JR : Development of the breastfeeding Attrition Prediction Tool. Nursing Research 43(2) : 100-104, 1994
17) Haku M, Yamano S, Takebayashi M, Takeuchi M : Teating Orem's self-care deficit theory : dependent care agency for duration of breastfeeding, The Journal of Nursing Investigation 1 : 34-43, 2003
18) Connie MD (1997)/Onodera T : SelfCare Deficit Theory of Nursing, Igaku-Shoin,Tokyo, 1999, pp. 28-33
19) Orem DE : Nursing : Concepts of practice (5 th ed.) Mosby, St.Louis 242-244, 1995
20) Taylor SG, Renpening KE, Geden EA, et al. : A theory of dependent-care : A corollary theory to Orem's theory of self-care, Nursing Science Quarterly 14(1) : 39-47, 2001
21) Maternal and child health statistics of Japan,Mother's & Children's Health Organization, Tokyo, 2006, p. 131

BRIEF REPORT

Changes in lower extremity muscle mass among bedridden patients with post-stroke hemiplegia in the acute post-stroke period

Ayako Tamura[1], *Takako Ichihara*[1], *Shinjiro Takata*[2], *Takako Minagawa*[1], *Yumi Kuwamura*[1], *Takae Bando*[1], *Hiroko Kondo*[1], *Natuo Yasui*[2], *and Shinji Nagahiro*[3]

[1]*Major in Nursing, School of Health Science, The University of Tokushima, Japan,*
[2]*Department of Orthopedies, and* [3]*Department of Nurosurgery, Institute of Health Biosisciences, The University of Tokushima Graduate School, Tokushima, Japan*

Abstract The present study analyzed 16 patients who were bedridden for one week immediately after onset of post-stroke hemiplegia. We used DXA (dual energy X-ray absorptiometry) to determine changes in muscle mass in the lower extremities on both paralyzed and non-paralyzed sides. The first measurement was conducted 3 to 5 days after the onset, and the second measurement was conducted 7 days after the first. Muscle mass in the lower extremities was reduced by approximately 600g (9%) on the paralyzed side with and by 200g on the non-paralyzed side (3%) in the Brunnstrom stage ≤ Ⅱ group (n=5). Although the decrease of muscle mass in the Brunnstrom stage ≥ Ⅲ group (n=11, relatively slight degree of functional motion impairment) was not significant, a decrease of approximately 300g (decrease rate : 5%) was observed on the paralyzed side and approximately 100g (decrease rate : 1.5%) was seen on the non-paralyzed side. Hence, muscle mass declined on both sides, and this occurred regardless of degree of paralysis. The findings suggested that conventional range of motion exercises, functional position maintenance, and postural changes are inadequate to prevent disuse muscle atrophy in post-stroke patients ; thus, it is necessary to develop a new rehabilitation program which adopts different exercises such as trunk motion, even for patients in the acute stage after stoke onset.

Key words : acute post-stroke period, hemiplegia, lower extremity muscle, disuse muscle atrophy , dual energy X-ray Absorptiometry (DXA)

Introduction

Prevention of disuse syndromes, particularly disuse muscle atrophy, in patients who require rehabilitation for hemiplegia due to stroke, is an important issue for patients who require early-stage rehabilitation[1,2]. However, in the acute post-stroke period, prevention of disuse syndromes must be performed while managing the disease progress and the risk of secondary complications. Therefore, although the need for prevention of disuse syndromes has been recognized, no standardized practical methods have been established[3].

Most studies on disuse muscle atrophy have used chronic stage post-stroke patients as subjects[4−8] ; only one observed the course of stroke from the acute to

2006年 7 月18日受付
2006年 9 月 1 日受理
別刷請求先：田村綾子, 〒770-8509 徳島市蔵本町 3 -18-15
徳島大学医学部保健学科看護学専攻

chronic periods[9]. For evaluation of changes in lower extremity muscles, CT, ultrasonography, nerve conduction studies, and muscle strength analyzers have been conducted ; however DXA (dual energy X-ray absorptiometry) has not been used for this purpose in post-stroke patients. DXA, which is commonly used for measurement of bone density, can also be applied to body composition measurement in which three body components, bone, muscle, and fat, are distinguished and measured individually for each right and left extremity[10]. Moreover, it is very accurate when used in this way, with measurement error ranging between 0.2 and 2.2%[10,11].

By measuring muscle amount for each body region in acute post-stroke patients and revealing the changes, it is possible not only to provide scientific validation of the intensity and contents of the bed-side exercises currently administered by nurses, and guidance for the patients, but also to contribute to disuse muscle atrophy prevention. Conducting such a study in the field of nursing should therefore be highly meaningful.

In the present study, changes in lower extremity muscle mass were measured using DXA in acute post-stroke patients who had been subject to bed-rest shortly after the onset.

Objective

Using DXA, we aimed to[1] reveal changes in lower extremity muscle mass on the paralyzed and non-paralyzed sides in acute stage post-stroke patients within 2 weeks from the onset, and[2] provide suggestions for nursing intervention based on the results.

Method

1. Subjects

Subjects consisted of 16 patients who were urgently admitted to hospital "A" due to stroke in the period between May 2005 and January 2006. In these patients, hemiplegia was observed, and it was possible to carry out the first measurement immediately after the onset and the second measurement 7 days after the first measurement.

2. Method and Analysis

DXA (QDR Delphi (Hologic, Inc. USA)) was adopted for measurement of muscle mass in each left and right lower extremity. The first measurement was conducted 3-5 days after the onset, and the second measurement was conducted on the 7th day after the first measurement. Brunnstrom stage was determined according to the medical records on the first DXA measurement day.

In data analysis, regarding the difference between first and second measurements of muscle mass, the average value and decrease rate were calculated for each paralyzed and non-paralyzed side. The decrease rate was calculated based on the following formula : (muscle amount in the first measurement-muscle amount in the second amount)/muscle amount in the first measurement×100. The subjects were divided into 2 groups : "mostly immobile (stage Ⅱ or below)" and "slightly or completely mobile (stage Ⅲ or above)" according to the degree of motion of the paralyzed lower extremity. Average values and decrease rates were calculated for each group. A Wilcoxon matched-pair signed-rank test was performed to analyze the data using SPSS 11.5 for Windows with statistical significance set at $P<0.05$.

3. Ethical considerations

The present study was conducted after receiving the approval of the Ethics Committee for Clinical Research at Tokushima University Hospital. The contents of the study were explained to the subjects and their families. Upon explaining orally and in a document that the participation was voluntary, that nobody would be disadvantaged in medical treatment and nursing due to discontinuation or lack of participation in the study, and that privacy would be protected, agreement to participate was obtained in writing.

Results

Table 1 shows the clinicodemographic background of the 16 subjects. They comprised 11 men and 5 women with an average age of 63.1 (SD 12.4). Cause of stroke (primary disease) was cerebral infarction in 9 subjects,

and intracranial hemorrhage in 7. Hemiplegia was left-sided in 11 subjects with and right-sided in 5. The Brunnstrom stage≥ Ⅲ group comprised 11 subjects, while the Brunnstrom stage ≤ Ⅱ group comprised 5 subjects.

Average decrease in lower extremity muscle mass (g) and decrease rate are shown in Table 2. Average decrease in muscle mass was significantly greater on the paralyzed side than the non-paralyzed side (382 g (SD293) vs. 127 g (SD279), $P<0.05$). In the Brunnstrom stage ≥ Ⅲ group (n=11), average decrease was significantly greater on the paralyzed side than the non-paralyzed side (304 g (SD275) vs. 108 g (SD307), $P<0.05$); decrease rate was 4.6% and 1.4% on the paralyzed and non-paralyzed sides, respectively. In the Brunnstrom stage ≤ Ⅱ group (n= 5), in which the degree of hemiplegia was more severe, the average decrease on the paralyzed side was as large as 554 g (SD 282) and the decrease rate reached 9.3%. The average decrease on the non-paralyzed side was lower at 168g (SD232), with a decrease rate of 2.6%; however, the difference between the paralyzed and non-paralyzed sides was not significant.

Table 1 Background of subjects

		Male	Female	Total
Gender		11	5	16
Age	40-49	1	5	2
	50-59	5	1	6
	60-69	0	2	2
	70-79	3	0	3
	Above 80	2	1	3
Primary disease	Cerebral infarction	7	2	9
	Intracranial hemorrhage	4	3	7
Side of paralysis	Right	2	3	5
	Left	9	2	11
Degree of hemiplegia				
Brunnstrom stage Ⅲ or above (lower extremities)		7	4	11
Brunnstrom stage Ⅱ or below (lower extremities)		4	1	5

Discussion

The importance of preventing disuse syndromes and developing a rehabilitation program based on a sufficient level of risk management for post-stroke patients 1-2 weeks after the onset is well-recognized[1,2]. Since muscle atrophy rapidly progresses within 2 weeks of stroke onset, and it takes 8 weeks to recover from this damage[8], it is particularly necessary to develop measures to prevent muscle atrophy and declining muscle strength immediately after stroke onset. However, it remains to be clarified whether and how much early-stage rehabilitation prevents disuse muscle atrophy. The present study therefore attempted to reveal changes in lower extremity muscle mass in post-stroke patients within 2 weeks after stroke onset.

According to a previous CT study of a patient group who required total care 2 weeks after stroke onset, femoral muscle cross sectional area decreased by 19%

Table 2 Average decrease and rate of decrease of lower extremity muscle mass

		N	Muscle amount decrease (g) Mean (SD)	Decrease rate (%)	Wilcoxon matched-pair signed-rank test
All cases	Paralyzed side	16	382 (293)	6.1	*
	Non-paralyzed side	16	127 (279)	1.8	
Brunnstrom stage Ⅲ or above (lower extremities)					
	Paralyzed side	11	304 (275)	4.6	*
	Non-paralyzed side	11	108 (307)	1.4	
Brunnstrom stage Ⅱ or below (lower extremities)					
	Paralyzed side	5	554 (284)	9.3	n. s.
	Non-paralyzed side	5	168 (232)	2.6	

(*; $P<0.05$ n. s.: not significant)

on the paralyzed side and by 21% on the non-paralyzed side[9]. In the present Brunnstrom stage≤ Ⅱ group, which had approximately the same degree of paralysis at the same interval after stroke as the patients in the above-mentioned study, lower extremity muscle mass decreased by approximately 600 g (decrease rate : 9 %) on the paralyzed side and 200 g (decrease rate : 3 %) on the non-paralyzed side. Furthermore, like the above-mentioned study[9], we observed a decrease in muscle mass not only on the paralyzed side but also on the non-paralyzed side, and this reduction became more significant as the degree of paralysis became more severe. In the present study, after the initial examination (3-5 days after stroke onset) nurses performed postural changes and functional position maintenance and physiotherapists performed forced range of motion exercises on all patients in this study. Nonetheless, decreases of muscle mass were observed.

Therefore, based on the present findings indicating that a more significant degree of decrease occurs in muscle mass as the severity of motor functional impairment increases, and that disuse muscle atrophy occurs on both paralyzed and non-paralyzed sides, we can make the following suggestions. It is necessary to actively conduct rehabilitation on bedridden patients from immediately after stroke onset, and the greater the motor paralysis, the more actively the rehabilitation should be conducted. Rehabilitation should be applied to include the lower extremities of both the paralyzed and non-paralyzed sides. It is necessary to provide complete instruction regarding motion exercises for both sides. It was also suggested that trunk muscle movement should be included when exercising the lower extremities for bedridden patients.

Furthermore, in the present study, DXA enabled the comparison of muscle weight between the entire left and right lower extremities. This technique should therefore be further for evaluating muscle mass in this situation.

References

1) Masakado Y, Chino N : The current states of stroke rehabilitation in Japan. Brain and Circuration 5 (4) : 317-322, 2000 (in Japanese)

2) Miyoshi S : Early rehabilitation of cerebral apoplexy. Japanese Medical Business New Account 3596 : 45-49, 1993 (in Japanese)

3) The joint committee on guidelinens for the management of stroke : The Japanese guidelinens for the management of stroke (2004)

4) Okawa Y, Ueda S : The disuse uscle atrophy in the hemiplegic patients : the muscle weakness in the "unaffected" extremities. Jpn J Lihabil Med 25(3) : 143-147, 1988 (in Japanese with English abstract)

5) Odajima N, Ishiai S, Okiyama R, et al : Recovery of atrophic leg muscles in the hemiplegics due to cerebrovascular accidents-Computed tomographic study. Brain Attack 10 : 74-78, 1988 (in Japanese with English abstract)

6) Umahara T, Sasaki A, Imamura T, et al : Ultrasound Imaging of anterior tibial muscle in hemiplegics due to cerebrovascular disease. Jpn J Med Imaging 10(1) : 38-43, 1991 (in Japanese with English abstract)

7) Umahara T, Kitaoka T, Imamura T, et al:Ultrasound Imaging of anterior tibial muscle in hemiplegics due to cerebrovascular disease. Jpn J Lihabil Med 29(2) : 145-151, 1993 (in Japanese with English abstract)

8) Kondo K : Muscle fiber conduction velocity study as an indicator of muscle atrophy in the hemiplegia. Jpn J Lihabil Med 36(7) : 477-484, 1999 (in Japanese with English abstract)

9) Kondo K, Ota T:Changes with time in cross-sectional areas of leg muscles in early stroke rehabilitation patients : disuse muscle atrophy and its recovery. Jpn J Rehabil Med 34(2) : 129-133, 1997 (in Japanese with English abstract)

10) Rose A, Heymsfield S, Lohman T : Human Body Composition, Human body composition, Human Kinetics Publishers Inc, 1996, Japanese translation, Komiya S. Taishukan, 2001

11) Kawakatu M, Shimogaki K, Korenari Y, et al : Body compositional anylysis by Dual energy X-ray Absorptiometry : basic evaluation. A M J 23(2) : 65-66, 1991

論文査読委員への謝辞

JNI Vol. 5 No. 1の論文査読は，編集委員のほかに，下記の方々にお願い致しました．ご多忙中にもかかわらずご協力賜りましたことに，お名前を記してお礼申し上げます．

泉キヨ子，岡本　茂樹，岸田佐智，酒井禎子，山口　雅子　　（五十音順）

JNI Vol. 4 No. 2の論文査読者名に記載漏れがありました．
お詫び申し上げますとともに，本号にお名前を記してお礼申し上げます．

齋藤　　憲

18年度以降の The Journal of Nursing Investigation 原稿募集のご案内

看護学に関する原稿を募集します．奮ってご投稿下さい．発行は定期的に年２回です．
本誌への原稿の締め切りは，下記のとおりです．

１号（９月30日発行）：５月31日原稿締め切り
２号（１月31日発行）：９月30日原稿締め切り

掲載料は１ページ7,000円で，カラー印刷など特殊な印刷や，別刷りは投稿者実費です．
問い合わせ先：〒770-8503　徳島市蔵本町3-18-15　国立大学法人徳島大学医学部
The Journal of Nursing Investigation（JNI）編集部　Tel：088-633-7104；Fax：088-633-7115
e-mail : shikoku@basic.med.tokushima-u.ac.jp

The Journal of Nursing Investigation

発　行　元：　国立大学法人徳島大学医学部
〒770－8503　徳島市蔵本町３丁目18－15
電　話：088－633－7104
ＦＡＸ：088－633－7115

The Journal of Nursing Investigation　第5巻　第1号

平成18年9月25日　印刷
平成18年9月30日　発行
発行者：曽　根　三　郎
編集者：關　戸　啓　子
発行所：徳島大学医学部
〒770－8503　徳島市蔵本町3丁目18－15
電　話：088－633－7104
ＦＡＸ：088－633－7115
振込銀行：四国銀行徳島西支店
口座番号：普通預金　0378438　JNI編集部
印刷人：乾　　孝　康
印刷所：教育出版センター
〒771－0138　徳島市川内町平石徳島流通団地27番地
電　話：088－665－6060
ＦＡＸ：088－665－6080