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Impact of an educational intervention on the behavioural pharmaceutical care scale

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Abstract

Objective: To describe and evaluate an educational intervention that is designed to enable pharmacists in a Nigerian teaching hospital to provide pharmaceutical care (PC) and to assess the impact of the intervention on an existing behavioural PC scale. Special attention was paid to develop a documentation format.

Method: A pharmaceutical educational intervention was undertaken. The impact of the intervention on the pharmacists' potential to deliver PC was quantitatively evaluated using a standard behavioural PC scale.

Results: There were significant differences between self-reported knowledge ($t = 3.212$; $p = 0.003$), attitudes ($t = 2.868$; $p = 0.008$) and self-efficacy ($t = 2.537$; $p = 0.016$) (pre-intervention and post-intervention).

Conclusion: The educational intervention enhanced the pharmacists' potential to deliver PC and also generated two systems of documenting PC activities.

Keywords: *Educational intervention, pharmaceutical care scale, pharmacy education, Nigeria*

Introduction

Principles of good pharmacy education are now centred on pharmaceutical care (PC) (FIP 1998). PC philosophy is highlighting the value of pharmacists and the future of pharmacy profession. The pharmacy profession advocates that pharmacists offer PC to improve patients' health, in addition to dispensing medications (Hepler & Strand, 1990). PC activities include monitoring patients' symptoms, counselling, resolving drug-related problems, facilitating communication with physicians and performing patient and drug focused interventions as appropriate (Hepler & Strand, 1990, Strand, Cipolle, Morley, & Perrier, 1991). To perform these activities and take responsibility for the outcomes of drug therapy, the pharmacist needs a professional orientation that is focused on the patient.

Despite the widespread support by several professional organisations, the universal practice of PC has been hindered by many obstacles (Chisholm & Wade, 1999, Van Mil, De Boer, & Tromp, 2001). Some of the barriers identified include lack of adequate technology and personnel, time constraints and negative attitudes concerning PC (May 1993). The provision of PC may be viewed as goal-oriented, reflecting the implicit decision making process which pharmacists may undertake because attitudes (i.e. beliefs and affective evaluations) and training issues, such as efficacy, have been suggested as barriers to providing PC (Raisch, 1993, Venkataraman, Madhavan, & Bone, 1997).

An educational intervention has been developed to meet the pharmacist's knowledge, skills and attitudinal needs. The pharmacist's cognitive and affective abilities are intermediate outcomes in an educational intervention programme. The patient outcomes are the clinical, humanistic and economic outcomes after the provision of PC. Reports indicate that these outcomes improve following PC research and education interventions (Kassam et al., 2001, Volume, Farris, Kassam, Cox, & Cave, 2001).

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Following the implementation of an "educational intervention" to enable pharmacists to provide PC, both the intermediate and final outcomes of such an intervention have to be evaluated. Reutzel, Defalco, Hogan, & Kazerooni (1999) employed focus group methodology to evaluate a PC education series for chain pharmacists in the United States of America. The focus group method, while being a valid and reliable tool in qualitative research, is considered inappropriate when the primary concern is not data collection, alack of experience or statistical projections are needed (Morgan & Krueger, 1993, Krueger 1994).

Odedina, Segal, Hepler, Lipowski, and Kimberlin (1996) developed the pharmacists' implementation of PC model around the theory of goal-oriented behaviours. They found that inconsistencies between pharmacists' behavioural intentions and behaviours might be due to differences in social norms, perceived behavioural control, self-efficacy and affect. They also found statistically significant differences between providers and non-providers of PC (Odedina & Segal, 1996, Odedina et al., 1996). Since the PC behaviour scale contains specific PC activities, it could be a good normative predictor of pharmacists' attitudes toward provision of PC. Time constraint is viewed as a barrier to PC, creating a potential conflict between delivering the novel PC and the traditional dispensing roles and patient care expectations. As a result, one suggested remedy is the utilization of pharmacy technicians in order to free time for the pharmacist to focus on patient related activities. One neglected component is the time required for pharmacists to undergo an educational intervention programme to gain relevant knowledge and skills. Many pharmacists lack the time for this training before it can be thought to change their orientation towards PC.

In an effort to evaluate PC in the University of Benin Teaching Hospital, Nigeria, we used two humanistic outcomes of PC in the initial needs analysis. Consumer outcomes included patient satisfaction with the existing pharmacy services; and patient expectations of activities promoted under the rubrics of PC (Oparah & Enato, 2003).

The patient satisfaction survey comprised a validated instrument, measuring patient satisfaction in two components, namely "a friendly explanation" and "managing therapy".

PC educational intervention was designed to enable the pharmacists to deliver PC within the time constraints. The objectives of this study were to describe the educational programme, develop a documentation process and assess its impact using the PC behaviour scale.

Methods

Setting

The study was carried out at the Pharmacy Department of the University of Benin Teaching Hospital, Nigeria. Benin City is located in the Southern part of the country. It is made up of residents of different socio-economic strata, with a population of about 1.2 million persons. Available healthcare facilities include a teaching hospital, a mental tertiary health facility and two secondary healthcare facilities. There are also more than one hundred community pharmacies and private hospitals/clinics and numerous traditional healing homes and proprietary medicine vendors.

The University of Benin Teaching Hospital, a 560-bed facility, serves as a clerkship and an internship-training centre for the Faculty of Pharmacy of the university. The pharmacy department of the hospital is made up of the main pharmacy and four other satellite units serving the outpatient department, obstetrics and gynaecology department, staff clinic and accident/emergency unit. The pharmacy department also houses the Drug and Poison Information Centre of the hospital. There were sixteen registered pharmacists and fourteen interns at the time of the study. Thirteen pharmacy technicians, who received a two-year post-secondary training in a school of health technology, served as support staff. Pharmacy services in the hospital are mostly limited to drug distribution and inventory management, with some fragments of clinical activities. Prescriptions generated from the hospital are normally filled in the hospital pharmacy, except when the required stocks are not available. Patients pay for their drugs and the pharmacy department runs a drug-revolving fund, an initiative of the nation's primary healthcare system. This system ensures a continuous availability of most required drugs, at a moderate price to the patients.

Pharmaceutical care (PC) educational programme

Pharmacists in the teaching hospital have weekly meetings during which the intervention training was held. The programme lasted for a period of 7 months, from May to November 2003.

We based the training on the practical guide PC implementation developed by Rovers, Currie, Hagel, Mcdonough, & Sobotka (1998). At the start, we stated that the mode of learning was self-directed. In each session, we gave a lecture on the topic for the day, followed by participatory discussions. We also provided some additional reading materials and encouraged the participants to study and partake in small group discussions. Before starting a new lecture, the topic for the previous week was briefly reviewed and clarifications made where necessary. Throughout the training, participants were taught that the purpose of PC was the responsible provision of drug therapy, to improve the quality of life for the patient (Hepler & Strand, 1990).

The topics covered during the PC implementation training are presented in Table I. At the end of the lectures, the authors held a group discussion to

Table I. Modules of PC lectures delivered.

Module 1:	
	○ Evolution of pharmacy practice to PC
	○ Need for PC
	○ Guidelines for PC
Module 2:	
	○ Patient data collection (objective and subjective data)
	○ Patient data evaluation and identification of health/drug therapy problems
	○ Development and implementation of PC plans
	○ Documentation of PC processes
Module 3:	
	○ PC for hypertensive patients
	○ PC for asthmatic patients
	○ PC for HIV/AIDS patients

develop ways to document PC activities. A documentation format was considered imperative for the implementation of PC. Based on studies by McDonough (1996) and Rovers et al. (1998), implementation forms were developed to prompt the pharmacist to collect patient specific data, evaluate the data for health and drug therapy problems, adopt appropriate patient/drug focused intervention and document the activities. The PC forms that were adopted are as shown in the Appendix.

Assessment of the educational programme

This was based on the 20-item behavioural PC scale developed by Odedina and Segal (1996), shown to differentiate providers from non-providers of PC. Prior to the commencement of the training programme, baseline data on pharmacists' cognition, attitudes and self-efficacy on the PC behavioural scale was obtained. We asked the pharmacists to state how much knowledge they had in performing the 20 items, using a Likert scale to collect data on cognition. The pharmacists were asked how much they understood, their attitudes and their confidence in performing the listed PC activities. The instrument allowed the respondents to indicate their gender, age and post-qualification experience. At the end of the training exercise, the same questionnaire was again administered. This was to evaluate the impact of the educational intervention on the behavioural PC scale. The questionnaires were completed and returned anonymously.

Data analysis

Responses from the pre- and post-intervention programme were entered into Microsoft Excel and checked before sorting. Thereafter, the data were loaded into SPSS version 11.0 for descriptive analysis and Graph Pad Instat version 2.05a for inferential statistical analyses. In performing the descriptive statistical analysis, we determined the mean scores and standard deviations for each PC activity. Factor loadings for the items were extracted to check if the items belonged to the same constructs. Literature describes that items with a factor loading of 0.4 and above can be grouped together (Kamei, Teshima, & Nakamura, 2000). Consequently the mean total score for each subscale was calculated. The instrument reliability was estimated through computation of Chronbach's alpha. Principal component analysis was employed using criterion (eigenvalue = 1.0); components were rotated using the Varimax rotation method and the percentage of total variance obtained was determined.

Finally, the interval scores from the pre- and post-intervention responses were compared using Welch's approximate *t*-test were compared. The alternate *t*-test was employed because the standard deviations obtained from the pre- and post-tests differed significantly. This suggested the data were from different populations.

Results

Demographics

A total of 21 pharmacists (12 males and 9 females) participated in the training programme. Three of them were more than 40 years, nine were aged 20–29 years and an equal number (9) of them were 30–years. Eleven had fewer than 5 years experience, five had 5–10 years post-qualification experience and two had 11–15 years post-qualification experience, while three of them had practiced for more than 20 years.

Pharmaceutical care documentation

Through an interactive session at the end of the training programme, two types of PC intervention documentation forms were adopted. Page A prompted the pharmacist to collect and record the patients' demographics, social, medical, medication and compliance histories. Page B prompted recording important laboratory findings and physical observations relevant to pharmacotherapy. Page C provided space for the drug therapy problem list and PC plan and Page D was blank for notes.

The second form was a one-page pad (Page E), which pharmacists in the out patient pharmacy units used to document their PC activities. As not all the patients would require detailed data collection and evaluation, the form was therefore designed for quick PC intervention and documentation.

Pharmaceutical care behaviour scale

Twenty-one pharmacists completed the pre-test questionnaire, while 16 completed the post-test. Those who could not attend up to 80% of the sessions

Table II. Cognition scores for pre-test and post-test with comparative analysis.

PC behaviour	Pretest (± S.D)	Posttest (± S.D)
Provide advice about non-prescription medication	3.90 ± 0.89	4.43 ± 0.51
Identify patient-specific drug related problem, e.g. not taking drug, receiving wrong drug, taking too much drug	3.43 ± 1.33	4.29 ± 0.61
Obtain patient's symptoms, e.g. cough, dizziness, diarrhoea, dry mouth, nausea	3.19 ± 1.33	4.29 ± 0.73
Make a recommendation to a patient if a drug related problem is identified, e.g. non-compliance	3.90 ± 1.34	4.57 ± 0.51
Obtain patient's medication history, e.g. present drug, past drug, drug allergies	3.57 ± 1.50	4.79 ± 0.43
Obtain patient's compliance history	3.33 ± 1.64	4.43 ± 0.51
Make a drug or non-drug recommendation to patient's physician if a drug related problem is identified, e.g. uncontrolled hypertension, duplicate therapy	3.33 ± 1.43	4.36 ± 0.63
Individualize the treatment regimen for the patient	2.71 ± 1.45	4.14 ± 1.10
Obtain patient's medical history, e.g. present medical problems, severity, prognoses	2.81 ± 1.57	4.14 ± 0.66
Identify the patient's desired therapeutic goal for their drug therapy	3.33 ± 1.39	4.21 ± 0.58
Monitor patient's outcome to determine if therapeutic goals have been achieved	2.81 ± 1.54	4.00 ± 0.68
Identify therapeutic alternatives to meet the patients desired goals	2.95 ± 1.36	4.21 ± 0.70
Establish a monitoring plan to follow the patient's progress with therapeutic goals	2.57 ± 1.47	4.07 ± 0.73
Document an intervention with a patient, manual or computerized if an intervention was necessary	2.48 ± 1.25	3.93 ± 0.92
Document intervention with a patient's physician, manual or computerized if an intervention was necessary	2.62 ± 1.53	3.71 ± 0.83
Document PC activities on a computerized or manual system	2.52 ± 1.54	3.92 ± 0.95
Obtain patient's description, e.g. age, gender, weight	3.52 ± 1.69	4.71 ± 0.47
Obtain patient's social history, e.g. smoking, alcohol	3.52 ± 1.66	4.79 ± 0.43
Obtain/measure patient's vital signs, e.g. blood pressure, heart rate	2.33 ± 1.46	3.86 ± 1.10
Obtain applicable laboratory values, e.g. drug levels, electrolytes, renal function	2.05 ± 1.32	3.21 ± 1.67
Mean total	60.90 ± 28.69	84.07 ± 14.75

$t = 3.212$; $p = 0.003$.

were excluded from the post-test. In the pre-test instrument, the cognition subscale produced a reliability of $\alpha = 0.978$ and all the items had factor loadings ranging from 0.698 to 0.932 for the cognition subscale. Of the 20 PC behaviours, the pharmacists indicated above average ratings in 10 behaviours. The mean total score for this subscale was found to be 60.90 ± 28.69 (range, 20–100; midpoint, 60), Table II. High standard deviations indicated high variations in perceived knowledge of the pharmacists. Principal component analysis extracted three components; one large component accounted for 71% of the total variance obtained.

The attitudes subscale had a reliability of $\alpha = 0.960$ and all the items produced factor loadings that ranged from 0.607 to 0.953. The pharmacists indicated positive attitudes to their performance of 15 of the 20 PC behaviours. The mean total score obtained was 67.51 ± 28.58 (range, 20–100; midpoint, 60), Table III. Again, the range in attitude was wide. Four components were extracted, the largest component accounted for 57% of the total variance.

The efficacy subscale produced an alpha reliability of $\alpha = 0.978$; determination of communalities showed factor loadings of 0.649–0.941. Respondents indicated high efficacy in 11 out of the 20 PC activities. The mean total score was 63.19 ± 26.18 (range, 20–100; midpoint, 60), Table IV. Three principal components were extracted and one major component yielded 72% of the total variance.

The post-test questionnaire had three similar subscales to the pre-test scales. In the cognition subscale, the alpha reliability was computed to be $\alpha = 0.924$ and the factor loadings ranged from 0.695

Table III. Attitudes scores for pre-test and post-test with comparative analysis.

PC behaviour	Pretest (S.D)	Posttest (S.D)
Provide advice about non-prescription medication	4.14 ± 1.06	4.93 ± 0.27
Identify patient-specific drug related problem, e.g. not taking drug, receiving wrong drug, taking too much drug	4.00 ± 1.05	4.71 ± 0.61
Obtain patient's symptoms, e.g. cough, dizziness, diarrhoea, dry mouth, nausea	3.71 ± 1.06	4.50 ± 0.76
Make a recommendation to a patient if a drug related problem is identified, e.g. non-compliance	4.14 ± 1.06	4.71 ± 0.47
Obtain patient's medication history, e.g. present drug, past drug, drug allergies	3.57 ± 1.54	4.64 ± 0.63
Obtain patient's compliance history	3.50 ± 1.43	4.64 ± 0.50
Make a drug or non-drug recommendation to patient's physician if a drug related problem is identified, e.g. uncontrolled hypertension, duplicate therapy	3.29 ± 1.49	4.50 ± 0.85
Individualize the treatment regimen for the patient	3.19 ± 1.40	4.07 ± 1.27
Obtain patient's medical history, e.g. present medical problems, severity, prognoses	3.24 ± 1.41	4.21 ± 0.80
Identify the patient's desired therapeutic goal for their drug therapy	3.71 ± 1.49	4.57 ± 0.65
Monitor patient's outcome to determine if therapeutic goals have been achieved	3.25 ± 1.62	4.36 ± 0.93
Identify therapeutic alternatives to meet the patients desired goals	3.33 ± 1.71	4.36 ± 0.84
Establish a monitoring plan to follow the patient's progress with therapeutic goals	3.29 ± 1.52	4.50 ± 0.76
Document an intervention with a patient, manual or computerized if an intervention was necessary	2.90 ± 1.37	4.29 ± 0.99
Document intervention with a patient's physician, manual or computerized if an intervention was necessary	3.29 ± 1.52	4.07 ± 1.00
Document PC activities on a computerized or manual system	2.95 ± 1.63	4.14 ± 1.10
Obtain patient's description, e.g. age, gender, weight	3.38 ± 1.47	4.57 ± 0.65
Obtain patient's social history, e.g. smoking, alcohol	3.38 ± 1.56	4.71 ± 0.61
Obtain/measure patient's vital signs, e.g. blood pressure, heart rate	2.67 ± 1.53	4.14 ± 1.10
Obtain applicable laboratory values, e.g. drug levels, electrolytes, renal function	2.57 ± 1.66	3.93 ± 1.38
Mean total	67.51 ± 28.58	88.57 ± 16.17

$t = 2.868$; $p = 0.008$.

to 0.945 for all the activities. We calculated a mean score of 84.07 ± 14.75 (range, 20–100; midpoint 60) for all 20 of the activities, all of which received positive ratings, Table II. Principal component analysis produced five dimensions and one major component accounted for 46% of the total variance. In terms of the attitudes post-test subscale, the internal consistency estimated by alpha was 0.940 and all the 20 PC activities produced factor loadings that ranged from 0.764 to 0.992. Table III presents the mean scores with standard deviations, thus yielding a mean total score of 88.57 ± 16.17 (range, 20–100; midpoint, 60) and low deviations. Five components were extracted with one large component producing 53% of the total variance. The self-efficacy post-test subscale had a reliability of $\alpha = 0.931$. Determination of communalities showed that all the items had factor loadings that ranged from 0.737 to 0.990. Calculated mean total score was 80.5 ± 15.68, Table IV Varimax rotation yielded six components and one large component produced 53% of the total variance obtained.

Results of the inferential statistical analysis indicated significant differences between pre-intervention and post-intervention self-reported knowledge ($t = 3.212$; $p = 0.003$), attitudes ($t = 2.868$; $p = 0.008$) and self-efficacy ($t = 2.537$; $p = 0.016$).

Discussion

The philosophy of PC represents an accepted professional ideal for pharmacy. In order to ensure widespread practice, key issues like deficiencies in pharmacists' knowledge, negative attitudes and lack of

Table IV. Self-efficacy scores for pre-test and post-test with comparative analysis.

PC behaviour	Pretest (S.D)	Posttest (S.D)
Provide advice about non-prescription medication	3.90 ± 1.00	4.43 ± 0.51
Identify patient-specific drug related problem, e.g. not taking drug, receiving wrong drug, taking too much drug	3.33 ± 1.28	4.21 ± 0.58
Obtain patient's symptoms, e.g. cough, dizziness, diarrhea, dry mouth, nausea	3.67 ± 1.02	4.29 ± 0.61
Make a recommendation to a patient if a drug related problem is identified, e.g. non-compliance	3.95 ± 1.02	4.36 ± 0.50
Obtain patient's medication history, e.g. present drug, past drug, drug allergies	3.70 ± 1.34	4.64 ± 0.50
Obtain patient's compliance history	3.65 ± 1.27	4.43 ± 0.65
Make a drug or non-drug recommendation to patient's physician if a drug related problem is identified, e.g. uncontrolled hypertension, duplicate therapy	3.24 ± 1.26	4.07 ± 1.21
Individualize the treatment regimen for the patient	2.90 ± 1.26	3.79 ± 1.12
Obtain patient's medical history, e.g. present medical problems, severity, prognoses	2.86 ± 1.59	3.93 ± 0.83
Identify the patient's desired therapeutic goal for their drug therapy	3.60 ± 1.19	4.14 ± 0.66
Monitor patient's outcome to determine if therapeutic goals have been achieved	2.86 ± 1.49	3.86 ± 0.95
Identify therapeutic alternatives to meet the patients desired goals	3.14 ± 1.15	3.86 ± 0.95
Establish a monitoring plan to follow the patient's progress with therapeutic goals	2.81 ± 1.29	3.71 ± 0.83
Document an intervention with a patient, manual or computerized if an intervention was necessary	2.71 ± 1.23	3.79 ± 0.80
Document intervention with a patient's physician, manual or computerized if an intervention was necessary	2.71 ± 1.52	3.79 ± 0.70
Document PC activities on a computerized or manual system	2.67 ± 1.49	3.54 ± 1.05
Obtain patient's description, e.g. age, gender, weight	3.57 ± 1.66	4.57 ± 0.51
Obtain patient's social history, e.g. smoking, alcohol	3.52 ± 1.57	4.71 ± 0.47
Obtain/measure patient's vital signs, e.g. blood pressure, heart rate	2.43 ± 1.43	3.46 ± 1.05
Obtain applicable laboratory values, e.g. drug levels, electrolytes, renal function	1.95 ± 1.12	2.93 ± 1.21
Mean total	63.19 ± 26.18	80.50 ± 15.68

$t = 2.537$; $p = 0.016$.

self-efficacy must be overcome. This study seeks to address some of the barriers through an educational intervention. We employed a quantitative approach in evaluating an educational intervention. Evidence from argument of Odedina & Segal (1996), which states that providers and non-providers of PC can be distinguished using the behavioural PC scale, was also used. The high internal consistency of the subscales of the instrument at both the pre-test and post-test levels suggests its validity in this current investigation.

Results of the pharmacists' responses to the instrumental items have some positive indications. Self-reported knowledge, attitudes and self-efficacy scores improved significantly after the intervention. The standard deviations around the PC activities were halved after the educational intervention, suggesting harmonization of views on PC. Furthermore, the number of extracted components of the instrument items increased in the post-test, which indicates that the educational programme enabled the participants to see PC in a wider context, which was unlikely synonymous with the traditional pharmacy practice they were used to.

The enthusiasm shown by the participants to the training programme is worthy of note. This contributed to the evolution of two systems of documenting PC activities in the hospital under study; this is an indication that pharmacists intend to deliver PC to their patients.

It is useful to note some of the limitations to the study. Firstly, the improvements in the pharmacists' knowledge, attitudes and self-efficacy are self-reports, which are subject to bias. Judging from their

enthusiasm and the group involvement, the authors cannot rule out a halo effect. The PC educational intervention represents an intermediate process in the delivery of PC. The final outcome would be to test the patients' perspectives following the implementation of PC.

There are several implications from the study. Firstly, an educational intervention uses available time to start the training. Secondly, practising pharmacists are the ones to determine the form of PC they can provide; academic based pharmacists can only provide the theoretical framework. Finally, it would be beneficial to replicate this educational intervention in other hospitals and community pharmacies in Nigeria. Future research could document the implementation of PC in the study setting and measure its outcomes.

Conclusion

We have described an educational intervention programme to enable pharmacists in a Nigerian teaching hospital to deliver PC. The intervention improved the pharmacists' knowledge, attitudes and self-efficacy. The intervention also generated two systems of documenting PC activities. The behavioural PC scale proved to be a useful tool to assess PC educational intervention to pharmacists who are at the contemplative stage of introducing PC.

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References

Chisholm, M. A., & Wade, W. E. (1999). Factors influencing students' attitudes towards pharmaceutical care. *American Journal of Health-Systems Pharmacists*, *56*, 2330–2335.

FIP. (1998). Policy statement on good pharmacy education practice.

Hepler, C. D., & Strand, L. M. (1990). Opportunities and responsibilities in pharmaceutical care. *American Journal of Hospital Pharmacy*, *47*, 533–543.

Kamei, M., Teshima, K., & Nakamura, T. (2000). Comparative analysis of pharmacy services based on newly developed evaluation index. *Yakugaku Zasshi*, *120*(11), 1185–1191.

Kassam, R., Farris, K. B., Burback, L., Volume, C. I., Cox, C. E., & Cave, E. (2001). Pharmaceutical care research and education project: Pharmacists' interventions. *Journal of the American Pharmaceutical Association*, *41*, 401–410.

Krueger, R. A. (1994). Focus groups: A practical guide for applied research. 2nd ed *Thousand oaks*, Calif: Sage Publications.

May, J. R. (1993). Barriers to pharmaceutical care in the acute care setting. *American Journal of Hospital Pharmacy*, *50*, 1608–1611.

McDonough, R. P. (1996). Interventions to improve patient pharmaceutical care outcomes. *Journal of the American Pharmaceutical Association*, *536*, 453–466.

Morgan, D. L., & Krueger, R. A. (1993). When to use focus group and why. In D. L. Morgan (Ed.), *Successful focus groups: Advancing the state of the art* (pp. 3–19). Newbury Park, Calif: Sage Publications.

Odedina, F. T., & Segal, R. (1996). Pharmaceutical care behavior scale. *American Journal of Health-System Pharmacists*, *53*, 855–865.

Odedina, F. T., Segal, R., Hepler, C. D., Lipowski, E., & Kimberlin, C. (1996). Changing pharmacists practice pattern: Pharmacists' implementation of pharmaceutical care. *Journal of Social and Administrative Pharmacy*, *13*, 74–88.

Oparah, A. C., & Enato, E. F. O. (2003). Pharmaceutical care expectations of patients in a Nigerian teaching hospital. *Journal of Social and Administrative Pharmacy*, *20*(6), 219–224.

Raisch, D. W. (1993). Barriers to providing cognitive services. *American Pharmacy NS*, *33*(12), 54–58.

Reutzel, T. J., DeFalco, P. G., Hogan, M., & Kazerooni, P. V. (1999). Evaluation of a pharmaceutical care education series for chain pharmacists using the focus group method. *Journal of the American Pharmaceutical Association*, *39*, 226–234.

Rovers, J. P., Currie, J. D., Hagel, H. P., McDonough, R. P., & Sobotka, J. L. ISBN 091733090017 (1998). *A practical guide to pharmaceutical care*. Washington, DC: American Pharmaceutical Association.

Strand, L. M., Cipolle, R. J., Morley, P. C., & Perrier, D. G. (1991). Levels of pharmaceutical care: A needs-based approach. *American Journal of Hospital Pharmacy*, *48*, 547–550.

Van Mil, J. W. F., De Boer, W. O., & Tromp, T. F. J. (2001). European barriers to the implementation of pharmaceutical care. *International Journal of Pharmacy Practice*, *9*, 163–168.

Venkataraman, K., Madhavan, S., & Bone, P. (1997). Barriers and facilitators to pharmaceutical care in rural community practice. *Journal of Social and Administrative Pharmacy*, *14*, 208–219.

Volume, C. I., Farris, K. B., Kassam, R., Cox, C. E., & Cave, A. (2001). Pharmaceutical care research and education project: Patient outcomes. *Journal of the American Pharmaceutical Association*, *41*, 411–420.

Appendix: Pharmaceutical care Form

Page A

Institution:---------- Ward:---------- Date: ----------

Name: ---------- Age:----- Sex:---- Address:---------- Phone:----------
Height:-------- weight:-------- BMI ------- HR ------ BP ------ R/R ------- Tempt ---------- Pregnancy status ----------
Physician(s): ----------
Social history: married ----- single ------- living alone -------- Occupation: ----------
Smoking history: never smoked ---- stopped smoking ---- still smoking -----
Alcohol history: never drank ----- stopped drinking ----- still drinking ------ Caffeine consumption: -------
Food allergies: ----------
Drug allergies: ----------
Reactions: ----------
How many meals do you eat each day? ----- Special diet restriction: ----------
Family history:
Have you or any blood relative had:(Mark all that apply)

	self	relative		self	relative
asthma	---	---	lung disease	---	---
cancer	---	---	stroke	---	---
alcoholism	---	---	high blood pressure	---	---
depression	---	---	kidney disease	---	---
diabetes	---	---	mental illness	---	---
heart disease	---	---	other conditions ----------		

Present medical problem(s) ----------

Past medication history (Including herbal medicines)

Name/strength	Dosage regimen	Purpose	Source of R_x	Side effects/Problems	Outcome

Present medication history (Including herbal medicines)

Name/strength	Dosage regimen	Purpose	Source of R_x	Side effects/Problems	Outcome

Compliance history (Indicate missed doses and reasons): ----------
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Appendix: Drug therapy problem list **Page C**

Institution: Patient: Ward:

S/No	Drug therapy problem with description	Date	
		Identified	Resolved

Pharmaceutical Care Plan

Goal:

Care Plan:

Monitor & Review (Outcome measurement):

Pharmacist: ---------- Signature & Date:----------

NB: The reverse side of this form (Page D) is for free text notes

Appendix: Pharmaceutical care sheet **Page E**

Pharmaceutical care Sheet **Page E**

Pt. Name: ---------- Date:---------- Unit: ----------

Sex :------ Age: ---------- Allergies: ----------

Medical Problems: Medications:

Drug Therapy Problems with descriptions:

Notes:

Follow-up : ---------- Pharmacist: ----------

Signature & Date: ----------