# An Assessment of Collaboration Between Members of the Healthcare Team in Providing Medication Therapy Management (MTM)

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### Abstract

**Introduction:** Medication Therapy Management (MTM) is defined as "A personalized service designed to optimize health outcomes for individual patients". Collaboration between health professionals involves communication and decision-making with the aim of satisfying the patient's health needs while respecting the unique qualities, abilities and contribution of each professional. MTM is designed to improve collaboration among pharmacists, physicians, and other healthcare professionals.

**Objectives:** To assess the awareness of Medication Therapy Management among members of the healthcare team.

**Method:** This is a cross-sectional study designed to assess the awareness, analyze collaboration, perception and acceptance of healthcare professionals in providing medication therapy management service in fourteen (14) hospital facilities. A self-administered questionnaire was used to collect relevant data. The questionnaire was designed from the objective of study which is derived through intensive literature review and abducted from the Core Element of MTM service version 2.0. A stratified random sampling using senatorial district, in Delta state Nigeria, as strata was adopted to survey the sample population

**Results:** The total study sample was 227 medical practitioners, 106 (46.70%) female and 121(53.30%) male. Among them were 58(25.47%) physicians, 114(63.43%) nurses, 14(6.16%) laboratory scientist and 11 (4.84%) other health care professions. Fewer respondents have heard about MTM (42.3%); only 22.7% of them admitted that collaboration with pharmacists in providing MTM helped to improve overall patient care. Respondents' response on acceptance that pharmacists are adequately trained to provide clinical services to patients showed that 56.8% of them disagreed.

**Conclusion:** The health care professionals had little knowledge of Medication therapy management service, and the acceptance of collaborative practice with pharmacist rendering medication therapy management service has not been adequate among other members of the health care team. The measure of collaborative practice with pharmacist rendering Medication Therapy Management services has not been effective within health care practitioners in Delta State.

**Keywords:** Medication therapy management; Collaboration; Perception, Acceptance

## Introduction

In order to make healthcare more affordable and sustainable, the government and individual health systems are changing the way they take care of patients. This is more evident in developed countries where entire organizations are shifting to a team-based approach to health care, which requires collaboration between all health care providers to provide the best, most efficient and most cost-effective services to patients. The role of each health care provider is being re-examined and redefined, so that patients can be seen in the timeliest manner and by the most qualified provider Smith et al. [1].

In the world of pharmacy, this paradigm shift can be seen with the preparation of pharmaceutical care practitioners, or medication therapy management pharmacists, that are capable of working collaboratively with other members of the health care team to ensure that patients' drug therapy problems are identified and resolved, potential ones identified and prevented and the patients are getting the best possible outcomes from their drug therapy Cipolle et al. [2]; Bluml [3], American Pharmacists Association [4] and Ramalho [5].

Helper & Strand [6] defined pharmaceutical care as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life. Outcomes include cure of a disease, elimination or reduction of a patient's symptomatology, arresting or slowing of a disease process, and preventing a disease and symptomatology. Pharmaceutical care

focuses on the pharmacist's role in achieving therapeutic goals to improve the patient's quality of life. Oparah [7]. Helper & Strand [6] defined a new way to look at the responsibilities of the pharmacist and pharmacy services, applying the term 'pharmaceutical care' to this new concept of pharmacists' services.

## Medication therapy management

Medication therapy management is interwoven with pharmaceutical care. Both services enhance the pharmacist's responsibility to optimize drug therapy to achieve health outcomes of individual patients College Of Pharmacy, University Of Arizona defined Medication Therapy Management (MTM) as 'A personalized service designed to optimize health outcomes for individual patients. As defined in a consensus definition adopted by the pharmacy profession in 2004, medication therapy management (MTM) has been defined by the pharmacy profession as a distinct service or group of services that optimize therapeutic outcomes for individual patients [that] are independent of, but can occur in conjunction with, the provision of a drug product Bluml [3].

Medication Therapy Management includes a broad range of professional activities, including but not limited to performing patient assessment and/or a comprehensive medication review, formulating a medication treatment plan, monitoring efficacy and safety of medication therapy, enhancing medication adherence through patient empowerment and education, and documenting and communicating MTM services to prescribers in order to maintain comprehensive patient care. MTM is a relatively new concept here in Nigeria. Few studies have been done to assess the impact of Pharmacists' intervention on patient health outcomes, in Nigerian health facilities. A previous study done showed an improvement in the quality of life of hypertensive patients as a result of the interventions made by pharmacists. Akonoghrere et al. [8] The society has experienced an increase in adverse drug reactions and costs, which has prompted a call for an enhanced role for pharmacists in ensuring effective drug use and patient safety.

Medication Therapy Management includes five core components: Medication Therapy Review (MTR); Personal Medication Record (PMR); Medication-Related Action Plan (MAP); Intervention and/or Referral and Documentation and Follow up. These five core elements form a framework for the delivery of MTM services in pharmacy practice. Every core element is integral to the provision of MTM; however, the sequence and delivery of the core elements may be modified to meet an individual patient's needs. Comprehensive medication management includes an individualized care plan that achieves the intended goals of therapy with appropriate follow-up to determine actual patient outcomes. Some examples of patients that are referred to MTM services by any clinic staff member are: patients who are not reaching their therapeutic goals, patients taking multiple medications, patients who have questions about their medications, or patients who are not adherent to their medications.

In developed countries, such as the United States of America (USA), Medication Therapy Management (MTM) programs were first introduced as part of the Medicare Modernization Act of 2003. These policies incorporated MTM services with the goal to improve patient outcomes and reduce healthcare costs. Zhang et al. [9]. Such policies may be lacking in a society such as Nigeria. However, the major challenge is to assess the level of collaboration that exists among health care professionals in the country so that MTM services can provide the structure for a rational medication use process in a team-based care, that includes the MTM pharmacist, and is delivered to guarantee that all of a patient's goals of therapy are met Cipolle [2] and Ramalho [5].

## Inter- professional collaboration

In 1999, the Institute of Medicine (IOM) estimated that approximately 7,000 medication-error-related deaths occur each year in the hospital setting. From 1983 to 1993, there was an 8.5-fold increase in medication-related deaths. When extrapolated to the outpatient setting, it is estimated that an error occurs in up to 7.4% of all prescriptions dispensed. The IOM issued a written statement that "all health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team" Greiner & Knebel [10]. The IOM's statements, a call to action for increasing collaboration among healthcare professionals, are evidenced-based. When pharmacists, nurses, and physicians collaborate effectively on medication reconciliation, medication errors decrease significantly Murphy et al. [11]. When pharmacists and physicians collaborate, care quality and patient outcomes improved Borenstein et al. [12], Boudreau et al. [13] and Leape et al. [14] Collaboration in the primary care setting improves management of uncontrolled hypertension Borenstein et al. [12] and major depressive disorder Boudreau et al. [13] Adding a pharmacist to the patient care team in the critical care setting has been shown to decrease preventable adverse-drug-event rates by two-thirds Leape et al. [14]. Optimal patient care is difficult to achieve without collaboration, which is why pharmacists, physicians, nurses, and other healthcare providers need to work as interdisciplinary teams Zillich et al. [15].

There has been great interest in promoting collaborative practice between pharmacists, physicians and nurses. This is evidenced by the increased implementation and study of new models of collaborative practice in primary care settings in several continental European countries, Eickhoff & Schulz [16], Guignard & Bugnon [17] and Herborg et al. [18] several States in the USA Hammond et al. [19] and the Canadian provinces of Ontario Dolovich et al. [20]. More recently, the theme of the NAPPSA and ANPA had a joint convention cantered on collaboration: "Delivering Healthcare Through Multidisciplinary Collaboration".

## Impact of collaboration

**Pharmacists as part of the healthcare team:** The role of pharmacists has evolved from traditional dispensing to providing comprehensive medication therapy management in collaboration with other healthcare providers. Pharmacists can improve patients' health and the health care delivery system if they are part of the patient's health care team. One way to meet this goal is with a

collaborative practice agreement (CPA) between pharmacists and other health care providers Giberson et al. [21]. Patient care services provided by pharmacists can reduce fragmentation of care, lower health care costs, and improve health outcomes Giberson et al. [21]. As noted by Chisholm et al. [22]. patient health improves significantly when pharmacists work with physicians and other providers to manage patient care. Health Providers treasured the education that patients and them-selves gain from MTM pharmacists Heather et al. [23]. Another study Makowsky [24] found that physicians and nurse practitioners felt that the addition of pharmacists on the team had a positive impact on overall patient care and a significant education benefit for other professionals. This research hopes to assess the awareness of medication therapy management, the impact of collaboration between health care providers, healthcare professional perception and acceptance of Medication Therapy Medication practice that will provide optimum drug therapy to patients and improve their quality of life.

## Methods

The research hypotheses in this study are drawn from the dimensions of the predictor variable and measures of the criterion variable. The predictor variable in the study is the objective of the study which include; the knowledge, Impact of collaboration with the MTM pharmacist and healthcare practitioners' perception and acceptance of MTM, The criterion variable is the Healthcare professional which include: physician, nurse, laboratory scientist and others.

### Study design

This was a cross sectional study design to assess health practitioner's awareness, collaborative Impact, perception and acceptance of Medication Therapy Management service provided by pharmacist.

### Research setting

This research was carried out in fourteen (14) different private hospitals, spread all over Delta state, Nigeria. Only one government owned hospital was receptive for the research to be conducted in their facility, this was Central Hospital Agbor (CHA), a 400 Bed health care facility spread over 10 wards. Other research settings were private hospitals, these include: Group Christian Medical Centre (GCMC) Effurun, a 50 Bed health care facility spread over 6 wards; Regal Hospital (RH) Effurun, a 35 Bed health care facility spread over 5 Wards; Loyola Hospital (LH) Effurun, a 14 Bed health facility spread over 3 wards; Right -Way Clinic /Maternity (RWC) Effurun, a 25 Bed health care facility spread over 4 Wards; City-View Clinilic/ Maternity (CVC) Effurun, a 14 Bed health care facility spreads over 2 wards; Standard Diagnostic Centre (SDC) Effurun - designed for out-patients only; Pam General Out-Patient Clinic and Laboratory Effurun. Others include: Okparavero Memorial Hospital (OMH) Sapele, a 30 Bed health care facilities spread over 5 ward; St. James Hospital (SJH) Sapele, a 25 Bed healthcare facility spread over 7 wards; Liberal Clinic/Diagnostics Centre (LCDC) Sapele, a 41 Bed health care facility spread over 7 wards; Obule Medical Centre (OMC) Sapele, a 48 Bed heath facility spread over 10wards; Treasure hold Specialist Hospital (TSH) Sapele, a 12 Bed health care facility spread over 2wards; May Specialist Clinic/Diagnostic Centre (MSC) Sapele, a 10 Bed health care facility spread over 2 wards; Agbedia's Specialist Clinic (ASC) Sapele, a 12 Bed health care facility spread over 2wards.

### Sampling

**Sampling size determination:** A sample size of 385 respondents was obtained using an appropriate statistical formula for estimating minimum sample size in health studies Daniel, [25], Lwanga & Lameshow [26].

The simple formula can be used:

$n = Z^2 p (1-p)/d^2$

Where; n= sample size,

Z = Z-score statistic for a level of confidence, (95% z-score=1.96)

p= expected prevalence or proportion (p=0.5)

d = precision (d = 0.05),

It is also referred as (confidence interval) Margin of error of +/- 5%

$n = \{(1.96)2 \times 0.5(1-0.5)\}/ (0.05)^2$

$(3.8416 \times 0.25)/0.0025 = 384.16$

Therefore, 385 respondents were needed.

**1.1.1.** Sampling technique: The study setting was selected by stratified random sampling using Delta state senatorial district as strata. The hospitals were selected in Warri (Delta south senatorial district), Sapele (Delta central senatorial district) Agbor (Delta north senatorial district).

### Sampling population:

a) Inclusion criteria

Health care practitioners which included Physicians, Nurses, Laboratory scientist, Radiologist, Physiotherapist, Optometrist working in the hospital setting are included in this research to assess collaborative practice that would support MTM service etc.

b) Exclusion criteria

Pharmacists are being excluded because they are not part of the scope of this study. The study was focused on ascertaining the response of other healthcare professionals towards MTM service provided by the pharmacist.

### Research instrument

The research instrument used in collecting data for this study was a validated 18 item questionnaire that was modified to suit the study population and was pre-tested at General hospital Abraka, before final distribution of questionnaires to target population. The questionnaire was divided into four parts (Sections A-D)

being socio-demographics, knowledge, impact of collaboration, perception and acceptance of Medication Therapy Management.

## Data collection method

A structured self-administered questionnaire as well as personal interview was utilized in collecting data from the respondents. Data were collected between August and September 2015.

## Data analysis

The participants' responses were encoded, and the data were analyzed using Statistical Package for the Social Sciences (SPSS, Version 21). Descriptive analysis was used to calculate for the variable included in the study. The Null hypotheses formulated in this study were tested using chi square test given as 'p' value. The Statistical Package for Social Sciences (SPSS) Software was used in the calculation of 'p' value. Chi square test was used to identify any significant difference among the participants' responses regarding certain statements in the questionnaire with a significant level of p value of <0.05. Inferential statistic was use to describe and make generalization about the population from which the samples were drawn.

## Consent

Oral consent was obtained from the respondents in the various private hospitals used.

## Ethical approval

Ethical approval was sought and obtained from the Research and Ethics Committee, Central hospital Agbor.

## Result

### Descriptive analyses

Out of 385 questionnaire distributed to Health care professionals a total of 227 were retrieved. The respondents were 106 (46.70%) female and 121(53.30%) male. Among them were 58(25.47%) physicians, 114(63.43%) nurses, 14(6.16%) laboratory scientist and 11 (4.84%) others. The summary of the demographic data is shown in Table 1 below. Respondents' knowledge of MTM services was assessed, Table 2 showed nurses admitting that they were knowledgeable about MTM services were nurses more than the others. Collaborative practice with respondent is explained in Table 3. In general; the nurses had a high response. Most of the respondents, 36.1% nurses, and 14.1% physicians, did not agree that the pharmacist is knowledgeable enough to render MTM services. This finding is illustrated in Table 4.

**Table 1:** Healthcare professional demographic information (n=227).

| Demographic Information | n (%) |
|---|---|
| **Gender** | 121 (53.30) |
| Male | 106 (46.70) |
| Female | |
| **Age** | |
| 20-29 years | 49 (21.59) |
| 30-39 years | 61 (26.90) |
| 40-49 years | 62 (27.31) |
| 50 & Above | 55 (24.23) |
| **Profession** | |
| Physician | 58(25.47) |
| Nurse | 144(63.43) |
| Lab. Sci. | 14(6.16) |
| Others | 11(4.84) |
| **Specialty** | |
| Physician | |
| specialist | 25 (11.0) |
| General practitioner | 32 (14.1) |
| Nurse | 120 (52.9) |
| Staff nurse | 25 (11.0) |
| Midwifery | |

| | |
|---|---|
| Laboratory scientist | 14 (6.2) |
| Others | 5 (2.2) |
| Radiologist | 3 (1.3) |
| Physiotherapist | 3 (1.3) |
| Optometrist | |
| **Duration of Practice** | 25 (11.01) |
| 0-4 years | 105 (46.25) |
| 5-9 years | 55 (24.23) |
| 10-15 years | 42 (18.50) |
| 16 & Above | |

**Table 2:** Respondents knowledge of medication therapy management.

| Item | Health Care Professional | No n(%) | Yes n(%) | Total n(%) | Test/P-Value |
|---|---|---|---|---|---|
| Knowledge of medication therapy management | Physician | 36(15.9) | 22(9.7) | 58(25.6) | $x^2$ = 3.891 |
| | Nurse | 79(34.8) | 65(28.6) | 144(63.4) | p-val. =273 |
| | Lab. Sci. | 7(3.1) | 7(3.1) | 14(6.2) | |
| | Others | 9(4.0) | 2(0.9) | 11(4.8) | |

**Table 3:** Impact of inter-professional collaboration of medication therapy management.

| Item | Health Care Practitioner | No n(%) | Yes n(%) | Total n(%) | Test/p-Value |
|---|---|---|---|---|---|
| Collaborative practice with MTM pharmacist has helped you to improve overall patient care | Physician | 39 (17.2) | 19(8.4) | 58 (25.6) | $X^2$=2.473 |
| | Nurse | 111(48.9) | 32 (14.1) | 143 (63.0) | p-val.= 0.480 |
| | Lab sci | 11 (4.8) | 3 (1.3) | 14 (6.2) | |
| | Others | 9(4.0) | 3(1.3) | 12(5.3) | |

**Table 4:** Respondents perception and acceptance of MTM service.

| Item | Health Care Profession | A n(%) | SA n(%) | D n(%) | SD n(%) | Total n(%) | Test/p-Value |
|---|---|---|---|---|---|---|---|
| Pharmacist rendering MTM services have adequate knowledge/training to provide clinical service to patients | Physician | 17(7.5) | 5(2.2) | 32(14.1) | 4(1.8) | 58(25.6) | $x^2$ = 5.545 |
| | Nurse | 45(19.8) | 4(1.8) | 82(36.1) | 13(5.7) | 144(63.4) | p-val. = .784 |
| | Lab. Sci | 5(2.2) | 1(0.4) | 7(3.1) | 1(0.4) | 14(6.2) | |
| | Others | 2(0.9) | 0(0.0) | 8(3.5) | 1(0.4) | 11(4.8) | |

### Inferential statistic of the statistical hypotheses

Guidelines for accepting or rejecting the null hypotheses Ureginam 2015 are as follows: (1) p-value of > 0.05 (greater than) is the benchmark for rejecting the null hypotheses and (2) p value of < 0.05 is the benchmark for accepting the null hypotheses.

a) Hypotheses (Ho1): Respondents are not aware of Medication therapy management.

From the chi square table the significant level 5% is set. i.e. p <0.05.

From the calculated value in Table 2 above, $x^2$=3.891, p-value=0.354. The hypothesis is accepted because the calculated value of the chi square is less than the critical value at p<0.05, this result is not significant at p<0.05 (i.e. p<0.05 is statistically not significant.)

b) Hypotheses (Ho2): Collaborative practice with MTM Pharmacist has not helped respondent to improve overall patient care.

The significant level 5% (0.05), hence the p< 0.05.

From the calculated value in Table 3 above $X^2$=2.473, p-val= 0.48. The hypothesis is accepted because the calculated value of the chi square is less than the critical value at p<0.05, this result is not significant at p<0.05 (i.e. p<0.05 is statistically not significant.).

c)     Hypotheses (Ho3): MTM pharmacist does not have adequate knowledge/training to provide clinical service to patients.

The significant level 5% (0.05), hence the p< 0.05. From the calculated value in Table 4 above $x^2$ = 5.545, p-val. =0.78. The hypothesis is accepted because the calculated value of the chi square is less than the critical value at p<0.05, this result is not significant at p<0.05(i.e. p<0.05 is statistically not significant.)

## Discussion

P-values indicate that the findings above are not statistically significant; however, this study revealed majority of the respondent 34.8% (nurses) had no knowledge of medication therapy management service. This corroborates with the Pennsylvania study McGrath [1], many of the physicians were not familiar with MTM services, and only four of the twenty-three physicians worked side by side with a pharmacist to optimize patient care. The reason for this study respondent unawareness could be that healthcare providers working with MTM pharmacist misunderstood the service as 'Dispensing.' This also corroborates the findings of Heather et al. [23] and Schultz et al. [27] that the Primary Care Providers find it difficult to explain MTM services to patients and they couldn't make a distinction between "the pharmacist behind the counter" and the MTM pharmacist.

The above result is contrary to the findings of Surbhi [28] nearly 31% (n=9) of the medical students learned about such MTM services through friends and family, followed by 21% (n=6) who learned through working with pharmacists or in the pharmacy, where they had opportunity to communicate with pharmacists. On the evaluation of the Impact of collaboration, an appropriate population of the respondent 48.9% had no impact on collaborative practice with the MTM pharmacist to improve overall patient care. In previous studies it was reported that pharmacist care has little or negative impact on patient outcome however, collaborative impact with health care professionals was not effective. Holland et al. [29], O'Dell & Kucukarslan [30], Royal et al. [31], Salter et al. [32] and Van Wijk et al. [33]. Contrary to the findings of Machado et al. [34] and Makowsky et al. [24] conducted in an inpatient medical setting has also found that physicians and nurse practitioners working with pharmacists on the team had a positive impact on overall patient care and a significant education benefit for other professionals.

This study revealed that 36% respondent disagreed and 5.7%strongly disagreed with the MTM pharmacist having adequate knowledge/training to render clinical service to patient. The reason could be that the pharmacist in their health facility only dispenses, this would give health providers the impression that the pharmacist would not have the knowledge/training to provide medication therapy management service to patients. This is contrary to the findings in previous studies Heather et al. [23], McGrath et al. [1] and Alkhateeb et al. [35] that health care provider noted MTM pharmacists had a different type of expertise - knowledge about medications- that add to the knowledge of primary care providers and this improved the patients medication experience The findings

support the emerging role of pharmacists in direct patient care by improving adherence and disease state management [36].

## Conclusion

In light of the literature reviewed and the earlier stated objectives, three hypotheses were formulated and tested. The findings can be summarized as follows: The health care professionals had no knowledge of Medication therapy management service, and the impact of collaborative practice with pharmacist rendering medication therapy management service has not been effective and health care practitioners disagrees with the MTM pharmacist having adequate knowledge /training to render clinical service to patient.

## Implication of Findings

This study is an indication that the health care professionals do not understand the impact MTM services rendered by the pharmacists has on the overall wellbeing of the patients; they are yet to accept and capitalize on disciplinary differences, differential power and overlapping roles. It is therefore recommended that pharmacist should enlighten members of the health care team about medication therapy management and should make them understand the goals and potential impact of medication therapy management - a collaborative intervention. Also, there is need for a standard protocol to be designed that will meet the peculiarities of the Nigerian health sector where the roles of each member of the health care team is spelt out and adhered to.

## Conflict of Interest

There was no conflict of interest in this research work.

## References

1. Akonoghrere RO, Arute JE, Akparobore A (2016) Impact of pharmaceutical care intervention on the quality of life of a group of hypertensive patients. UK journal of Pharmaceutical and Biosciences 4(4): 19-28.

2. Alkhateeb FM, Unni E, Latif D, Shawaqfeh MS, Al Rousan RM (2009) Physician attitudes toward collaborative agreements with pharmacists and their expectations of community pharmacists' responsibilities in West Virginia. J Am Pharm Assoc 49(6): 797-800.

3. American Pharmacists Association (2010) Medication therapy management digest: Perspectives on 2009: A year of changing opportunities, American Pharmacists Association, Washington, USA.

4. Bluml BM (2005) Definition of medication therapy management: Development of profession wide consensus. J Am Pharm Assoc 45(5): 566-572.

5. Borenstein JE, Graber G, Saltiel E, Wallace J, Ryu S, et al. (2003) Physician-pharmacist comanagement of hypertension: A randomized, comparative trial. Pharmacotherapy 23(2): 209-216.

6. Boudreau DM, Capoccia KL, Sullivan SD, Blough DK, Ellsworth AJ, et al. (2002) Collaborative care model to improve outcomes in major depression. Ann Pharmacother 36(4): 585-591.

7. Chisholm Burns MA, Kim Lee J, Spivey CA, Slack M, Herrier RN, et al. (2010) US pharmacists' effect as team members on patient care: systematic review and meta-analyses. Med Care 48(10): 923-933.

8. Cipolle RJ, Strand LM, Morley PC (2004) Pharmaceutical care practice: The clinician's guide - (2nd edn), McGraw-Hill, New York, USA.

9. Daniel WW (1999) Biostatistics: A Foundation for Analysis in the Health Sciences. (7th edn), John Wiley & Sons, New York, USA.

10. Lwanga SK, Lemeshow S (1991) Sample size determination in health studies: A practical manual. Geneva: World Health Organisation 3: 11-88.

11. Dolovich L, Pottie K, Kaczorowski J, Farrell B, Austin, Z, et al. (2008) Integrating family medicine and pharmacy to advance primary care therapeutics. Clinical Pharmacology and Therapeutics 83(6): 913-917.

12. Eickhoff C, Schulz M (2006) Pharmaceutical care in community pharmacies: Practice and research in Germany. The Annals of Pharmacotherapy 40(4): 729-735.

13. Giberson S, Yoder S, Lee MP (2011) Improving patient and health system outcomes through advanced pharmacy practice. A Report to the US Surgeon General. MD: Office of the Chief Pharmacist, US Public Health Service; Rockville, USA.

14. Greiner AC, Knebel E (2003) Health professions education: A bridge to quality; institute of medicine (US) committee on the health professions education summit, National Academies Press, Washington, USA.

15. Guignard E, Bugnon O (2006) Pharmaceutical care in community pharmacies: Practice and research in Switzerland. The Annals of Pharmacotherapy 40(3): 512-517.

16. Hammond RW, Schwartz AH, Campbell MJ, Remington TL, Chuck S, et al. (2003) Collaborative drug therapy management by pharmacists. Pharmacotherapy 23(9): 1210-1225.

17. Herborg H, Sorensen EW, Frokjaer B (2007) Pharmaceutical care in community pharmacies: Practice and research in Denmark. The Annals of Pharmacotherapy 41(4): 681-689.

18. Heather L, Maracle, D, Ramalho de Oliveira, Amanda B (2012) Primary care providers' experiences with pharmaceutical care-based medication therapy management services, Innovations in Pharmacy 3(1): 72-81.

19. Hepler CD, Strand LM (1990) Opportunities and responsibilities in pharmaceutical care. American Journal of Hospital Pharmacy 47(3): 533-543.

20. Holland R, Desborough J, Goodyer L, Hall S, Wright D, et al. (2008) Does pharmacist-led medication review help to reduce hospital admissions and deaths in older people? A systematic review and meta-analysis. British Journal of Clinical Pharmacology 65(3): 303-316.

21. Leape LL, Cullen DJ, Clapp MD, Burdick E, Demonaco HJ, et al. (1999) Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. Journal of American association 282(3): 267-270.

22. Machado M, Bajcar J, Guzzo GC, Einarson TR (2007) Sensitivity of patient outcomes to pharmacist interventions. Part II: Systematic review and meta-analysis in hypertension management. Ann Pharmacother 41(11): 1770-1781.

23. Makowsky MJ, Schindel TJ, Rosenthal M, Campbell K, RT Tsuyuki, et al. (2009) Collaboration between pharmacists, physicians and nurse practitioners: A qualitative investigation of working relationships in the inpatient medical setting. Journal of Inter-professional Care 23(2): 169-184.

24. McGrath SH, Snyder ME, Dueñas GG, Pringle JL, Smith RB, et al. (2010) Physician perceptions of pharmacist-provided medication therapy management: qualitative analysis. J Am Pharm Assoc 50(1): 67-71.

25. Murphy E, Oxencis C, Klauck J, Meyer D, Zimmerman J (2009) Medication reconciliation at an academic medical center: Implementation of a comprehensive program from admission to discharge. American Journal of Health System Pharmacy 66(23): 2126-2131.

26. O Dell KM, Kucukarslan SN (2005) Impact of the clinical pharmacist on readmission in patients with acute coronary syndrome. The Annals of Pharmacotherapy 39(9): 1423-1427.

27. Oparah AC (2010) Essentials of Pharmaceutical Care 5: 43-56.

28. Ramalho de Oliveira D, Brummel A, Miller DB (2010) Medication therapy management: 10 years of experience in a large integrated health care system. J Manag Care Pharm 16(3): 185-195.

29. Surbhi S (2013) Perceptions of Medical Students on Pharmacists Provided Counseling Services and Collaboration with Pharmacists using the theory of Planned behaviour. Theses and Dissertations, The University of Toledo Digital Repository, Toledo, USA, pp. 58-68.

30. Royal S, Smeaton L, Avery AJ, Hurwitz B, Sheikh A (2006) Interventions in primary care to reduce medication related adverse events and hospital admissions: Systematic review and meta-analysis. Quality and Safety in Health Care 15(1): 23-31.

31. Salter C, Holland R, Harvey I, Henwood K (2007). I haven't even phoned my doctor yet. The advice-giving role of the pharmacist during consultations for medication review with patients aged 80 or more: Qualitative discourse analysis. British Medical Journal 334(7603): 1101.

32. Schultz H, Westberg S M, Ramalho de Oliveira D, Brummel A (2012) Patient-perceived value of Medication Therapy Management (MTM) services: A series of focus groups. Innovations in Pharmacy 3(4): 1.

33. Smith M, Giuliano MR, Starkowski MP (2011) In Connecticut: Improving patient medication management in pharmacy care. Health Affairs 30(4): 646-654.

34. Van Wijk BL, Klungel OH, Heerdink ER, de Boer A (2005) Effectiveness of interventions by community pharmacists to improve patient adherence to chronic medication: A systematic review. The Annals of Pharmacotherapy 39(2): 319-328.

35. Zhang J, Yin W, Sun S, Alexander GC (2008) Impact of Medicare Prescription Drug Benefit on the use of gereric drugs. Journal of Internal Medicine 23(10): 1673-1678.

36. Zillich A, Doucette W, Carter B, Kreiter C (2005) Development and initial validation of an instrument to measure physician-pharmacist collaboration from the physician perspective. Value Health 8(1): 59-66.

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