

Title:

Pharmacists' perceptions of diabetes self-management education and support (DSMES), diabetes prevention program (DPP), and medication therapy management (MTM) services: a state-wide study of Indiana

Incentive Grant Category:

Residents and their preceptors

Introduction:

The prevalence of diabetes continues to grow each year. The most recent estimates show that among the United States population, 34.2 million people have diabetes, 88 million people have prediabetes and an estimated 7.3 million people remain undiagnosed.¹ There are different programs that are available to help prevent and delay the long-term complications associated with diabetes.²⁻⁴ Diabetes Self-Management Education and Support (DSMES), Diabetes Prevention Program (DPP), and Medication Therapy Management (MTM) are three programs that are tailored to different audiences with different needs and desired outcomes.²⁻⁶ These programs have been shown to improve clinical outcomes, quality of life and can even reduce hospitalizations.^{3, 5, 7-10}

Diabetes education is continually evolving by expanding the variety of practitioners providing education and support activities.¹¹ Pharmacists can play a vital role in the development and delivery of DSMES, DPP, and MTM programs as they are well positioned to provide comprehensive diabetes programs.¹⁰ An integrated, pharmacist directed diabetes management and MTM have been shown to positively affect individuals by reducing their A1c and medication-related side effects.^{8, 10} Additionally, pharmacist led MTM helps to lower individual's A1c levels, decrease LDL levels and increase medication adherence.⁷⁻⁹ Pharmacists' generally have a positive intent to provide MTM but have identified that attitude, comfort level and ability are important factors that influence a pharmacist's likelihood of providing MTM.¹²⁻¹³ Common barriers to implementing MTM are lack of compensation, billing difficulties, insufficient time, and poor access to medical information.¹⁴⁻¹⁶

In Indiana it is estimated that 12.9% of the adult population has diabetes and 35.6% of population has prediabetes. Each year there are approximately 33,000 people diagnosed with diabetes. Diabetes and prediabetes cost Indiana \$6.6 billion each year.¹⁷⁻¹⁸ The Indiana State Department of Health (ISDH) along with their Governor and colleagues came up with the Indiana Diabetes Strategic Plan 2020-2026. There were six main goals associated with this strategic plan. Half of the goals were specific to increasing the number of DSMES and DPP and increasing the number of people utilizing diabetes self-management programs such as DSMES, DPP and MTM.¹⁸

There are currently no studies that evaluate pharmacists' perceptions of DSMES and DPP programs. Additionally, there is minimal data that measures pharmacists' interest in and barriers to the provision of DSMES, DPP and MTM programs in the state of Indiana. The identification of factors that influence these programs is essential to optimize health care for Indiana residents and the implementation of Indiana's Diabetes Strategic Plan. This study aims to assess Indiana pharmacists' level of interest in maintaining, expanding and developing these programs and identify specific barriers faced. The information published in this study can be used to help further expand DSMES, DPP and MTM programs across the state of Indiana.

Objectives:

The objective of this study is to 1) determine Indiana pharmacists' interest in starting, expanding or maintaining DSMES, DPP, and MTM programs, and 2) identify the barriers identified by Indiana pharmacists' regarding DSMES, DPP, and MTM programs

Methods:

Study Population and Respondent Recruitment:

The study population consisted of Indiana pharmacists over the age of 18 years of age. Respondents answered two initial questions to determine the appropriateness of participating in this study. The first eligibility question was to determine if this study was relevant to the respondent and the second was used to assure respondents were licensed Indiana pharmacists (Appendix 1). Those who responded no to either of these questions was excluded from the study. Additionally, respondents who completed < 5% of the survey items were excluded.

The study was distributed as an electronic survey via email to Indiana pharmacists. This study consisted of two phases of distribution to extend the amount of time the survey was available. The same survey and study population was used for both phases, the only difference was the distribution method and the length of time the study was available. For phase one, the electronic survey was distributed via email by Indiana Pharmacists Association (IPA) to both members and non-members of IPA. There are four different academies within IPA such as Indiana Academy of Community Pharmacists. For phase two, the survey was distributed via email by the different IPA Academy presidents to their respective academy members.

The distributed email contained information regarding their participation in the study. Respondents gained access to the web-based survey after reading a copy of the study information sheet and clicking the survey link, indicating they reviewed the study information sheet and agreed to participate in the survey.

Study Design:

A cross-sectional, state-wide survey was sent out to Indiana pharmacists via email in two phases. The 62-item survey instrument was inputted into Qualtrics Survey Software and administered electronically. The survey items were created in collaboration with ISDH and IPA consultation and utilized branch logic. Basic demographic data were collected. Questions measuring pharmacists' interests were evaluated and rated on a 5-point Likert scale. The remainder of the study questions included dichotomous, multiple choice and select all that apply questions.

Data Collection:

The study received exemption approval by the Purdue University's Human Research Protection Program Investigational Research Board (IRB) prior to the distribution of the survey. For phase one, the survey was available for six weeks and a reminder email was sent at weeks two and four. For phase two, the survey was available for four weeks and no reminder emails were sent. A small incentive of a \$5 Starbucks gift card was offered to the first 200 participants who completed the survey. Data was collected and stored using the web-based survey via Qualtrics.

Data Analysis:

Data analysis were performed using SPSSv26. Descriptive statistics were used to characterize and present the frequencies of the demographic data. The question items involving a 5-point Likert scale were summarized with the frequency at which each point, or interest, was picked. The remainder of the

survey items were summarized using descriptive statistics to calculate the mean with standard deviation, frequency and proportions. All descriptive statistics were rounded to the nearest tenth.

Results:

The survey was distributed to 1150 email addresses. Due to the survey being distributed via email by IPA and IPA Academy Presidents, it is unknown how many emails were returned to the sender or failed to send. Respondents (n=76, 6.6%) were prescreened for additional eligibility criteria by responding to 2 initial questions. Of the 67 eligible respondents, 64 completed the majority of the survey (95.5%).

The survey respondents represented a sample of licensed Indiana pharmacists from 25 of the 92 counties in Indiana. Major themes are summarized in Table 1. The mean age of pharmacists was 39 years of age and most respondents were female and held a PharmD degree. Most respondents did not have any formal post graduate training and did not hold an additional credential outside of a certificate program. The most common pharmacy practice setting was community pharmacy setting, followed closely by hospital or health system pharmacy setting, which including ambulatory care, Veterans Affairs (VA) and Federally Qualified Health Systems (FQHC).

DSMES:

Twelve respondents identified that their practice site has an established DSMES program (18.8%). Of those, most respondents identified that their DSMES program has concrete plans to maintain it (n=10, 83.3%). The majority of pharmacists identified that they had a very strong interest in maintaining their DSMES program (n=7, 58.3%), followed by a strong interest (n=3, 25%). The most commonly selected barriers to maintain their DSMES program was lack of payment or reimbursement, financial constraint to maintain the program, and lack of referrals from approved providers (Table 2).

Half of the respondents identified that there were concrete plans to expand their current DSMES program, defined as developed a timeline and resources identified (n=6, 50%). Most pharmacists identified their interest in expanding their DSMES program as strong (n=5, 41.7%), followed by very strong interest (n=3, 25%). The top barriers identified when expanding their DSMES program were lack of time to expand the program and class times are not convenient for individual or provider (Table 2).

The majority of respondents identified that they do not have an established DSMES program (n=52, 81.3%). Of that, only 3 respondents stated that there are concrete plans to develop a DSMES program including a developed timeline and identified resources (5.8%). Most pharmacists identified that they had a fair interest in developing a DSMES program (n=18, 34.6%) or neutral interest (n=18, 34.6%). The most common barrier identified when developing a DSMES program was lack of time to develop program, followed closely by lack of payment or reimbursement and none, I have not tried to expand this program (Table 2).

DPP:

Only 6 respondents had an established DPP (9.4%), half of which were recognized by the CDC. The majority of respondents identified that there were concrete plans to maintain their DPP (n=5, 83.3%). Most pharmacists identified that they had a very strong interest in maintaining their DPP (n=3, 50%). The top barriers identified when maintaining a DPP were lack of referrals from approved providers and low demand for program for the location.

Two respondents identified that there were concrete plans to expand their DPP (n=2, 33.3%). Pharmacists equally identified their interest level to expand their DPP as very strong, strong, or no

interest (n=2, 33.3%). The most commonly selected barrier for expanding DPP was low demand for program for the location and lack of referrals from approved providers (Table 2).

The majority of respondents did not have a DPP at their pharmacy practice site (n=58, 90.6%). Of those, only 1 respondent identified that there are concrete plans to develop a DPP (1.7%). Pharmacists had mixed interest in developing a DPP with neutral interest being the most common response (n=23, 39.7%) and fair interest being the second most common response (n=21, 36.2%). Most of the respondents identified that they have not tried to develop a DPP. Other common barriers identified were lack of time to develop program and lack of payment or reimbursement (Table 2).

MTM:

Unlike DSMES and DPP, the majority of respondents identified that they have an established MTM program at their current pharmacy practice site (n=38, 59.4%). Almost all respondents identified that there are concrete plans to maintain their current MTM program (n=37, 97.4%). Most pharmacists identified that they have a very strong interest in maintaining their MTM program (n=18, 47.4%). The most commonly identified barriers to maintaining the program was lack of time to perform programs, lack of payment or reimbursement and financial constraint to maintain the program (Table 2).

Nine respondents have concrete plans to expand their current MTM program (n=9, 23.7%). Most pharmacists identified their interest in expanding their MTM program as strong interest and neutral interest (n=11, 28.9%). The most common barriers found when expanding MTM programs were lack of time to perform programs, lack of payment or reimbursement and lack of available pharmacists to perform programs (Table 2).

Only 3 respondents had concrete plans to develop an MTM program (n=3, 11.5%) in the next year. The majority of pharmacists had a neutral interest in developing an MTM program (n=14, 53.8%). Most respondents identified that they have not tried to develop an MTM program. Other barriers identified when developing an MTM program were lack of time to perform the program and lack of payment or reimbursement (Table 2).

Discussion:

Indiana pharmacists who responded to this survey largely worked in the community pharmacy practice setting or hospital or health system (including ambulatory care, VA and FQHC). The results demonstrate that most Indiana pharmacists work at a practice setting that offers MTM programs but only a small majority offer DSMES and DPP programs. Respondents who did not have a DSMES, DPP or MTM program most often did not have concrete plans to develop the program, including a developed timeline and resources identified. This shows the potential to expand these programs across Indiana.

Indiana pharmacists expressed a very strong interest in maintaining their current DSMES, DPP and MTM program. However, Indiana pharmacist do not have as much interest in developing these programs. This is most likely due to the perceived barriers of developing these programs. When developing a DSMES, DPP, and MTM programs one of the top three most common barriers identified was, "None, I have not tried to develop this program." This identified barrier is reflective of Indiana pharmacists' interest in developing these programs.

The other two most commonly perceived barriers regarding the development of DSMES, DPP and MTM programs were lack of time, and lack of payment or reimbursement. The perceived barriers found from these survey results can be used by the ISDH to create a reimbursement toolkit for pharmacists and

other healthcare professionals. This reimbursement toolkit could include a collection of available information on the reimbursement process as well tips from pharmacies that have been successful in developing these services. The results from this study could be used for other efforts in the expansion of these programs across Indiana including holding diabetes map trainings. Diabetes map trainings would offer healthcare professionals with resources that can be used to develop ADCES and ADA approved curriculum. This would help decrease the time burden of developing DSMES programs.

A limitation of this study is the lower than expected number of respondents included in the survey. While the survey was sent via email to 1150 email addresses with an unknown amount of people who opened the email that contained the survey details. Due to IPA distributing the research survey, it is unknown how many email addresses were returned or did not go through to Indiana pharmacists' emails. Additionally, there were a few reports that licensed Indiana pharmacists did not receive the survey or that the survey was found in their junk or spam mailbox. A higher response rate would have been preferred for a more accurate representation of Indiana pharmacists. Fortunately, there was at least one respondent from over half of the counties in Indiana. Phase two was designed to increase the amount of time the survey was available. Unfortunately, phase two was conducted at the beginning of COVID19 pandemic and not many individuals responded to the survey during that time.

Factors that led to programs seeking accreditation or recognition and factors that led to successful reimbursement were not captured by this study. It would be valuable to conduct a study that examined these factors. Further, another distribution method may be helpful to better promote responding to the survey.

Conclusion:

Indiana Pharmacists have a strong interest in maintaining their current DSMES, DPP and MTM program but have less interest in developing these programs. The top three barriers identified when developing these programs included lack of time, lack of reimbursement and I have not tried to develop this program. The study findings offer important data about barriers faced when developing DSMES, DPP and MTM programs in order to develop a plan to help overcome these barriers, with the overall goal to increase these programs across Indiana.

Evaluation strategy:

The research project progress will be evaluated on a weekly basis by peer pharmacy residents, pharmacy fellows, residency research preceptors, and mentors. The PGY1 community pharmacy residents affiliated with Purdue University participate in a structured research developmental program created by Dr. Margie Snyder. The program is facilitated and overseen by Dr. Snyder and her research fellow, Dr. Lola Adeoye.

Dr. Margie Snyder, PharmD, MPH, DCCP

Dr. Snyder is an Associate Professor at the Purdue College of Pharmacy and Co-Director of Community Pharmacy Programs. In this role, she founded and directs the Medication Safety Research Network of Indiana (Rx-SafeNet), which is a statewide practice-based research network of approximately 140 community pharmacies. Moreover, Dr. Snyder has published over 35 peer-reviewed journal articles and mentored over 40 residents and fellows on research; many of which who have received grant funding and/or published their work in peer-reviewed journals. Dr. Snyder's total extramural funding support to date equals approximately \$2.5 million as Principal Investigator and exceeds \$1 million as Co-Investigator. Dr. Snyder serves as a temporary reviewer for the NIH HSOD and AHRQ HCRT study sections. She received the 2016 APhA Excellence in Community Pharmacy Residency Precepting Award,

the 2017 Joseph E. McSoley Pharmacist of the Year Award from the Indiana Academy of Community Pharmacists, and the 2018 Mentor of the Year Award for the Purdue College of Pharmacy Department of Pharmacy Practice. She has been named an outstanding/top reviewer for several major pharmacy journals including the *Journal of the American Pharmacists Association*, *Pharmacotherapy*, and *Research in Social and Administrative Pharmacy*. She speaks on a regular basis at national venues about her research program and on the topics of faculty/research program development and practice-based research networks. Alongside residents from each of the PGY-1 community practice residency programs affiliated with the College, the resident will complete a structured research project development program (“research series”) under Dr. Snyder’s mentorship. The program will enable the resident to systematically work through the process of designing, implementing and reporting the findings of a residency research project.

Dr. Lola Adeoye, PharmD

Dr. Adeoye completed this program as a PGY1 community pharmacy resident with Kroger/Purdue and successfully published her research in the *Journal of the American Pharmacists Association*. As an Indiana Clinical and Translational Sciences Institute Postdoctoral scholar, Dr. Adeoye’s intramural funding support through the National Institutes of Health, National Center for Advancing Translational Sciences, Clinical and Translational Sciences Award exceeds \$50,000. Moreover, Dr. Adeoye has positioned herself as a rising scholar in community pharmacy health services research with accolades such as selection as a 2018 AcademyHealth Diversity Scholar, receipt of a 2018 American College of Clinical Pharmacy travel award, and receipt of the 2018 Consortium for Research in Administrative Pharmacy award which recognizes the best research and presentation at the biannual Midwest Social and Administrative Pharmacy Conference.

Dr. Jasmine D. Gonzalvo, Pharm.D., BCPS, BC-ADM, CDE, LDE

Dr. Gonzalvo is a Clinical Associate Professor of Pharmacy Practice in the College of Pharmacy at Purdue University. Her clinical practice for Eskenazi Health involves the provision of Cardiovascular Risk Reduction services operating under a collaborative practice agreement in a population with serious mental illness and for those who primarily speak Spanish. Dr. Gonzalvo’s research interests and publications relate to cardiovascular risk reduction in individuals with serious mental illness, integration of the Spanish language into both her practice and academic settings, and diabetes self-management education and services in the pharmacy setting. Her teaching areas within the College of Pharmacy involve diabetes, dyslipidemia, patient centered medical homes, motivational interviewing, and cultural competence. She served on the Board of Directors for the American Association of Diabetes Educators (AADE) from 2015 through 2017. She is the current Chair-Elect on the Board of Directors for the National Certification Board for Diabetes Educators. She is active in diabetes-related advocacy efforts at the State and Federal levels. In 2018, she was appointed as one of 12 non-federal members to the National Clinical Care Commission. She has been recognized with several teaching and mentorship awards throughout her career.

Dr. Brock Davis, PharmD, BC-ADM, MATS

Dr. Davis completed this program as a PGY1 community pharmacy resident with HealthLinc/Walgreens/Purdue and successfully published his research in the *Journal of the American Pharmacists Association*. He currently serves as an ambulatory care pharmacist at HealthLinc in Mishawaka. Dr. Davis is serving as my site research mentor on this project.

References:

1. Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2020. <https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf>. Accessed March 2020.
2. Center for Disease Control and Prevention. Diabetes self-management education and support (DSMES) toolkit. Updated March 6, 2018. <https://www.cdc.gov/diabetes/dsmes-toolkit/index.html>. Accessed Sep 2019.
3. Powers MA, Bardsley J, Cypress M, et al. Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American diabetes association, the American association of diabetes educators, and the academy of nutrition and dietetics. *Diabetes Care*. 2015 Jul;38(7):1372-1382.
4. Center for Disease Control and Prevention. Diabetes prevention program. Updated August 2019. <https://www.cdc.gov/diabetes/prevention/index.html>. Accessed Sep 2019.
5. National Institute of Diabetes and Digestive and Kidney Diseases. Diabetes Prevention Program. <https://www.niddk.nih.gov/about-niddk/research-areas/diabetes/diabetes-prevention-program-dpp>. Accessed Sep 2019.
6. Medication therapy management in pharmacy practice: core elements of an MTM service model. The American Pharmacists Association and the National Association of Chain Drug Stores Foundation. https://www.pharmacist.com/sites/default/files/files/core_elements_of_an_mtm_practice.pdf. Updated March 2008. Accessed Sep 2019.
7. Erku DA, Ayele AA, Mekuria AB, et al. The impact of pharmacist-led medication therapy management on medication adherence in patients with type 2 diabetes mellitus: a randomized controlled study. *Pharm Pract*. 2017 Jul-Sep;15(3):1026.
8. Twigg G, Motsko J, Thomas J, et al. Pharmacist-managed diabetes center interventions ensure quality and safety in elderly patients. *Consult Pharm*. 2017;32(5):299-310
9. Skinner JS, Poe B, Hopper R, et al. Assessing the effectiveness of pharmacist-directed medication therapy management in improving diabetes outcomes in patients with poorly controlled diabetes. *Diabetes Educ*. 2015 Aug;41(4):459-65.
10. Meade LT, Tart LT, and Buzby HL. Evaluation of diabetes education and pharmacist interventions in a rural, primary care setting. *Diabetes Spectr*. 2018 Feb;31(1):90-95.
11. [Martin AL, Warren JP, Lipman RD. The landscape for diabetes education: results of the 2012 AADE national diabetes education practice survey. *Diabetes Educ*. 2013 Sep-Oct;39\(5\):614-22.](#)
12. Blake KB and Madhavan SS. Perceived barriers to provision of medication therapy management services and the likelihood of a pharmacist to work in a pharmacy that provides MTMS. *Ann Pharmacother*. 2010 Mar;44(3):424-31.
13. Herbert KE, Urmie JM, Newland BA, et al. Prediction of pharmacist intervention to provide Medicare medication therapy management services using the theory of planned behavior. *Res Social Adm Pharm*. 2006 Sep;2(3):299-314.
14. Lounsbery JL, Green CG, Bennett MS, et al. Evaluation of pharmacists' barriers to the implementation of medication therapy management services. *J Am Pharm Assoc*. 2009;49(1):51-8.
15. Bright DR, Lengel AJ, Powers MF. Pharmacists' perceptions of barriers to implementing medication therapy management and the role of pharmacy technicians in overcoming the barriers. *J Pharm Technol*. 2009;25(6):361e367.
16. Adeoye OA, Lake LM, Lourens SG, et al. What predicts medication therapy management completion rates? The role of community pharmacy staff characteristics and beliefs about medication therapy management. *J AM Pharm Assoc*. 2018;S7-S15.
17. American Diabetes Association. The Burden of Diabetes by State. Updated 2016. <http://main.diabetes.org/dorg/PDFs/Advocacy/burden-of-diabetes/all-states.pdf>. Accessed Sep 2019.
18. Indiana State Department of Health. Indiana Diabetes Strategic Plan 2020-2026. <https://www.in.gov/isdh/files/update%20ids%20plan.pdf>. Accessed Mar 2020.