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Patient Assessment Skills Pertinent to Practicing Pharmacists

Jennifer A. Wilson

Rashi C. Waghel

Danny Salem

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Patient assessment skills pertinent to practicing pharmacists

Jennifer A. Wilson, PharmD, BCACP; Rashi C.Waghel, PharmD, BCACP; and Danny Salem, PharmD Candidate 2016
Wingate University School of Pharmacy

Abstract
Objectives: To describe pharmacists' opinions regarding which patient assessment skills are necessary to understand and/or perform to provide optimal patient care in pharmacy practice.
Methods: An online questionnaire was distributed to pharmacists licensed in North Carolina (n=14,167), as identified by the Board of Pharmacy. The 80 patient assessment items in the questionnaire were derived from a course text book and faculty experience. Participants indicated whether they "need to understand and be able to perform", "need to understand only", or "not need to understand or be able to perform" each item in their current practice setting. Descriptive statistics were used to describe background demographics and perceived need for each item. Post-hoc chi-square analyses were performed to determine differences in need based on practice setting and Pharm.D. degree completion.
Results: Of 1036 responses received, 770 were used in data analysis; incomplete questionnaires and non-practicing pharmacist responses were excluded. Fifty-nine percent of respondents held a Pharm.D. degree. Participants identified their practice site(s) as inpatient (29%), outpatient (16%), community/retail (50%), long term care (5%), and other (8%). The top five patient assessment items respondents identified as important to understand and perform included automatic blood pressure measurement (63%), point of care testing (57%), manual blood pressure measurement (53%), heart rate measurement (52%), and peak flow meter use (47%). Post-hoc analyses showed a significant difference among those with a Pharm.D. versus those without for the response "need to understand and be able to perform" for 20 patient assessment items; a significant difference was also noted among practice settings for 29 items.
Conclusions: The top items pharmacists identified they need to both understand and perform could be applied in various practice settings. The study results may guide which patient assessment items should be included in pharmacy education and training.

Introduction

The role of the pharmacist has changed over the years and continues to evolve, especially with the emergence of the patient-centered medical home and collaborative practice models[1]. As part of this evolution, pharmacists have started to incorporate physical assessment skills, which have been traditionally performed by other health care providers, into everyday clinical practice[2]. Bolesta and colleagues noted these assessment skills are necessary in conducting complete and accurate patient evaluations, and pharmacists have become more involved in utilizing these skills as pharmacy services have become more directly related to patient outcomes[3].

Pharmacists are often considered the medication experts of the health care team. The addition of specific patient and physical assessment skills to their established medication-related knowledge gives pharmacists an opportunity to enhance their role in a collaborative setting[2]. At least 36 states authorize physician-pharmacist collaborative drug therapy management in any practice setting with a specified provider protocol[4]. Due to these collaborations and the continued expansion of direct patient care services provided by pharmacists in various settings, patient assessment skills may become even more important to pharmacists.

Though it is established that patient assessment skills are important to pharmacy practice, there is limited published

Corresponding Author: Jennifer A. Wilson, PharmD, BCACP
Assistant Professor of Pharmacy
Wingate University School of Pharmacy
515 N. Main Street, Wingate, NC 28174
j.wilson@wingate.edu; (f) 704-233-8332

literature regarding which specific patient assessment items pharmacists are using and feel are necessary to perform and/or understand in practice, especially as the role of the pharmacist continues to evolve. This research aims to help elucidate some of the patient assessment items pertinent to a practicing pharmacist. For the purposes of this research, the terms physical assessment and patient assessment are used synonymously.

Objective

The primary objective of this research was to describe pharmacists' opinions regarding which patient assessment skills are necessary to understand and/or perform in order to provide optimal patient care in pharmacy practice. Secondary objectives included identifying differences in opinion between those practitioners with a Pharm.D. and those without a Pharm.D. degree, and examining differences among various practice settings.

Methods

Between June and July 2014, an online SurveyMonkey® (SurveyMonkey Inc., Palo Alto, CA) questionnaire was distributed via email to all pharmacists actively licensed in North Carolina, as identified by the Board of Pharmacy. The questionnaire link was sent directly by the Board of Pharmacy. A reminder email was sent two weeks later.

The questionnaire consisted of 11 major groups of patient assessment categories with multiple assessment items listed for each category, for a total of 80 patient assessment items. The list of skills was derived from a course text book, Bates' Guide to Physical Examination and History Taking[5], and faculty experience. The list was intended to be as comprehensive as possible, representing all of the topics covered in the text book. Of the 80 items, less than 10% were added based on faculty experience within the institution's physical assessment course and clinical practice. Examples of additions included peak flow meter use, spirometry, monofilament testing, and point of care testing. Full definitions were not included for each assessment item, however some examples of broad topics were included to help further clarify.

Participants were asked to indicate whether they "need to understand and be able to perform", "need to understand only", or "not need to understand or be able to perform" each item in their current practice setting. All three options were given for each item for consistency, though the authors recognize that pharmacists may not have authorization to perform all of the skills in their entirety. Demographic information was also collected including gender, age, years practicing, degree, and practice setting. For the purposes of

this research project, setting options were divided into inpatient, community (retail), outpatient (clinic settings), long-term care, and other. The questionnaire was reviewed internally by the school research group and revised before distribution to practicing pharmacists. This study was approved by the university's research review board.

All pharmacists actively licensed in the state were sent the questionnaire to capture data from a variety of practice settings. The Board of Pharmacy distributed the survey electronically on behalf of the investigators and sent a reminder 2 weeks after the initial email to complete the survey, if not already completed. Completion of the questionnaire indicated participant's voluntary consent. At the conclusion of the questionnaire, the participant could also voluntarily enter their contact information for a chance to win a gift card.

In order to capture responses of practicing pharmacists only, participants were asked at the beginning of the survey to indicate if they were currently practicing pharmacy. If they answered no, the survey ended.

Descriptive statistics were used to describe background demographics and respondents' opinions regarding the need for each item. Post-hoc chi-square analyses were performed to determine differences in need based on respondent practice setting (e.g. inpatient, outpatient, community, etc.) and Pharm.D. degree completion.

Results

The questionnaire link was initially sent to 14,418 email addresses, of which 14,101 were deliverable. The reminder email was sent to 14,508 email addresses, of which 14,167 were deliverable. Since the email had to be sent by the Board of Pharmacy, it is not possible to determine the number of open and viewed emails.

Of the 14,167 deliverable emails, 1,036 responses were received (7.3%). Of the 1,036 responses received, 770 were used in data analysis (74%); incomplete questionnaires and responses from non-practicing pharmacists were excluded. Based on the deliverable emails, the usable response rate was 5.4%.

Fifty-nine percent of included respondents held a Pharm.D. degree. Participants identified their practice site(s) as inpatient (29%), outpatient (16%), community/retail (50%), long term care (5%), and other (8%). The other category included, but was not limited to, administration, academia, home infusion, and industry. All demographic information is in Table 1.

The top five patient assessment skills identified as important to both understand and perform included automatic blood pressure measurement (63%), point of care (POC) testing (57%), manual blood pressure measurement (53%), heart rate measurement (52%), and peak flow meter use (47%). The top five patient assessment items respondents identified as important to understand only included breast self-examination instruction (58%), visual acuity testing (57%), breath sounds auscultation (57%), visual fields testing (56%), and pulse strength grading (55%). Winging of the scapula testing (56%), anal reflex testing (56%), lumbosacral radiculopathy testing (54%), eye examination with ophthalmoscope (54%), and tactile fremitus (54%) were the top patient assessment skills that respondents indicated were not necessary to understand or be able to perform. See Tables 2-12 for additional results organized by major groups.

Post-hoc analyses showed that a significantly greater percentage of pharmacists with a Pharm.D. degree felt they need to understand and be able to perform the following items compared to respondents without a Pharm.D. degree: pain assessment; extra-ocular movement inspection; lymph node palpation; breath sounds auscultation; jugular venous distension (JVD) inspection or pressure measurement; heart sounds auscultation; bowel sounds auscultation; skin inspection; pulse strength grading; peripheral edema inspection or palpation; appearance and behavior assessment; speech and language assessment; mood assessment; thoughts and perceptions assessment; cognitive function testing; mini mental status examination (MMSE); monofilament testing; POC testing; Homan's sign testing; and testicular self-examination instruction (all p<0.05).

A significant difference was also noted among all practice settings for 29 items in regards to which items need to be both understood and performed. However, since two categories (long-term care and other) had such small sample sizes, differences were not identified as relevant. Among the remaining categories (community, inpatient, and outpatient), a significant difference was noted for 27 items.

When comparing inpatient to community settings, respondents in the inpatient group felt that five items were significantly more important to understand and perform including pain assessment, JVD inspection/pressure measurement, carotid arteries assessment, bowel sounds auscultation, and heart sounds auscultation (p<0.05). The community group felt that 11 items were significantly more important to understand and perform including automatic blood pressure measurement, manual blood pressure measurement, palpatory pressure measurement, heart rate

measurement, respiratory rate measurement, temperature measurement, peak flow meter use, hair inspection/palpation, nail inspection/palpation, mole detection, and POC testing (all p<0.05).

When comparing outpatient to community settings, respondents in the outpatient group felt that 15 items were significantly more important to understand and perform including pain assessment, ear examination with otoscope, JVD inspection/pressure measurement, carotid arteries assessment, heart sounds auscultation, pulse strength grading, peripheral edema inspection/palpation, appearance and behavior assessment, speech and language assessment, mood assessment, thoughts and perceptions assessment, cognitive function testing, MMSE, monofilament testing, and Homan's sign testing (all p<0.05). The community group felt that two items were significantly more important to understand and perform including automatic blood pressure measurement and mole detection.

When comparing outpatient to inpatient settings, respondents in the outpatient group felt that 17 items were significantly more important to understand and perform including automatic blood pressure measurement, manual blood pressure measurement, palpatory pressure measurement, heart rate measurement, respiratory rate measurement, pain assessment, peak flow meter use, pulse strength grading, peripheral edema inspection/palpation, appearance and behavior assessment, speech and language assessment, mood assessment, thoughts and perceptions assessment, cognitive function testing, MMSE, monofilament testing, and POC testing (p<0.05).

Discussion
The top five patient assessment items identified as both important to understand and perform seems consistent with what skills pharmacists may use in practice when providing services. Examples of services that may utilize the listed skills may include blood pressure monitoring, beta blocker titration, point of care testing (cholesterol, glucose, A1c, anticoagulation, etc.), and asthma care plans. This is especially important as clinical services expand. The results also show that pharmacists perceive that understanding may be more important than ability to perform for certain patient assessment items that pharmacists may not frequently perform. Understanding is likely important when reading and interpreting communications or progress notes from other health care professionals.

Post-hoc analyses suggest those who have completed a doctor of pharmacy program feel more items are necessary to perform in practice, which may be due to receiving more

training in this area. Further research is needed to determine exactly why differences exist. Post-hoc analyses suggest that different practice settings place varying emphases on patient assessment items, which would be expected based on the different services provided in various practice settings. Some skills, such as bowel sounds and heart sounds auscultation, seemed more important in the inpatient setting as compared to outpatient and retail, while others, such as blood pressure and heart rate measurement, were more significant to the outpatient and retail settings. Additional research could help further delineate these differences between practice settings.

The list of skills included in the questionnaire was intended to be as comprehensive as possible. The authors recognize that some of the items listed may not be applicable to current pharmacy practice, however a comprehensive list was used to avoid introducing too much personal opinion bias by limiting items based solely on experience. The extent to which some items are used may be impacted by the scope of practice within each state.

A variety of practice settings exist across the state of North Carolina, including many opportunities for collaboration with other health care professionals due to the clinical pharmacist practitioner program (CPP)[6]. The CPP program allows for licensed pharmacists meeting certain requirements to provide drug therapy management under the supervision of a physician, similar to other mid-level practitioners[6]. The variety of settings may result in differences in perceptions of which skills are pertinent to pharmacy practice. Further research may help identify regional differences that could exist across different states.

Limitations
The survey was distributed only to practicing pharmacists within North Carolina. The results may not be representative of the perceptions of all practitioners. The survey method also resulted in a low response rate, which can occur when a large number of individuals are surveyed. However, despite the low response rate, there were more than 1,000 respondents representing a variety of practice settings. Additionally, upon review of the state board of pharmacy statistics for 2014, the gender and practice setting demographics of registered pharmacists generally aligned with the sample respondents[7].

Different interpretations or lack of understanding of the specific patient assessment items may have been an additional limitation to this study. Not all respondents may have had the same understanding of the listed patient assessment skills. Since this survey was conducted

anonymously through an online service, there was not an opportunity for participants to ask for further clarification. Lack of understanding may have led to increased response for "not necessary to understand or perform". Additionally, there may be varied definitions of the word "understanding" (e.g., detailed knowledge versus general familiarity), which could have impacted how individuals responded.

Conclusion
Certain items, such as blood pressure measurement and point of care testing, seem more widely perceived as necessary for pharmacists to be able to perform in practice. Other items, such as breast self-examination instruction and visual acuity testing, should be understood but do not necessarily need to be performed on a routine basis. The results of this study may be helpful in determining the extent to which patient assessment skills should be implemented in the curriculum when training pharmacists and student pharmacists to better prepare for clinical practice.

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Table 1: Demographic Information (n=770)

Sex	Male = 40.5%
	Female = 59.5%
Age Range	<25 years = 0.9%
	25-34 years = 28.2%
	35-44 years = 24.9%
	45-54 years = 20.0%
	55-64 years = 19.0%
	>65 years = 7.0%
Degrees, Training, and Certifications	B.S. = 56.6%
	Pharm.D. = 58.5%
	Ph.D. = 1.2%
	PGY-1 pharmacy residency = 20.1%
	PGY-2 pharmacy residency = 7.4%
	Fellowship = 1.2%
	Board certification = 16.4%
	Clinical Pharmacist Practitioner (CPP) = 4.2%
Years as a Practicing Pharmacist	<1 year = 5.1%
	2-5 years = 18.2%
	6-10 years = 13.8%
	11-20 years = 19.2%
	>20 years = 43.8%
Current Practice Setting	Inpatient = 28.7%
	Outpatient clinic = 15.2%
	Community = 49.9%
	Long term care = 4.9%
	Other = 13.1%
Years at Current Practice Setting	<1 year = 10.5%
	1-3 years = 23.8%
	4-6 years = 18.8%
	7-10 years = 13.5%
	>10 years = 33.4%

Table 2: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Vital Signs

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Automatic blood pressure measurement	485 (63%)	248 (32%)	36 (5%)
Manual blood pressure measurement	405 (53%)	320 (42%)	42 (5%)
Palpatory pressure measurement	178 (23%)	410 (54%)	176 (23%)
Heart rate measurement	401 (52%)	320 (41%)	48 (6%)
Respiratory rate measurement	262 (34%)	419 (55%)	82 (11%)
Temperature measurement	300 (39%)	413 (54%)	53 (7%)
Pain assessment (pain scales)	300 (39%)	376 (49%)	90 (12%)

Table 3: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Head, Eyes, Ears, Nose, and Throat

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Visual acuity testing	35 (5%)	437 (57%)	297 (39%)
Visual fields testing	27 (4%)	427 (56%)	313 (41%)
Inspection of abnormalities of the eye	52 (7%)	394 (51%)	322 (42%)
Inspection of extra-ocular movements	93 (12%)	384 (50%)	291 (38%)
Eye examination with ophthalmoscope	15 (2%)	341 (44%)	413 (54%)
Auditory acuity testing	19 (2%)	353 (46%)	395 (52%)
Ear examination with otoscope	38 (5%)	353 (46%)	378 (49%)
Oral cavity inspection	75 (10%)	368 (48%)	325 (42%)
Neck inspection	58 (8%)	366 (48%)	342 (45%)
Palpation of sinuses	33 (4%)	374 (49%)	361 (47%)
Palpation of lymph nodes	46 (6%)	381 (50%)	339 (44%)
Palpation of the thyroid gland	29 (4%)	384 (50%)	351 (46%)
Visual acuity testing	35 (5%)	437 (57%)	297 (39%)

Table 4: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Pulmonary

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Tactile fremitus	15 (2%)	341 (44%)	412 (54%)
Lung percussion	31 (4%)	393 (51%)	342 (45%)
Auscultation of breath sounds	85 (11%)	432 (57%)	247 (32%)
Chest inspection	52 (7%)	377 (49%)	335 (44%)
Peak flow meter use	362 (47%)	312 (41%)	95 (12%)
Spirometry	164 (21%)	422 (55%)	182 (24%)

Table 5: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Cardiovascular

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Inspection of JVD/measurement of pressure	86 (11%)	406 (53%)	277 (36%)
Carotid arteries assessment	53 (7%)	412 (54%)	302 (39%)
Palpation for heaves, lifts, or thrills	28 (4%)	389 (51%)	352 (46%)
Auscultation of heart sounds	63 (8%)	406 (53%)	298 (39%)
Heart murmur identification	35 (5%)	422 (55%)	308 (40%)

Table 6: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Abdomen

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Auscultation of bowel sounds	45 (6%)	421 (55%)	302 (39%)
Auscultation of abnormal abdominal sounds	32 (4%)	406 (53%)	331 (43%)
Percussion of the abdomen	27 (4%)	375 (49%)	366 (48%)
Light and deep abdominal palpation	24 (3%)	376 (49%)	367 (48%)
Liver palpation	25 (3%)	378 (49%)	366 (48%)
Percussion of the liver and/or spleen for size	24 (3%)	368 (48%)	376 (49%)
Palpation of the kidneys for enlargement	22 (3%)	370 (48%)	377 (49%)
Percussion of the kidneys for tenderness	22 (3%)	363 (48%)	381 (50%)
Testing for the presence of ascites	37 (5%)	396 (47%)	336 (44%)
Testing for appendicitis	30 (4%)	382 (50%)	356 (46%)
Testing for acute cholecystitis	21 (3%)	380 (50%)	361 (47%)

Table 7: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Musculoskeletal

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Joint inspection	99 (13%)	396 (51%)	275 (36%)
Joint palpation	57 (7%)	391 (51%)	319 (42%)
Range of motion testing	100 (13%)	403 (53%)	261 (34%)

Table 8: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Skin, Hair, and Nails

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Skin inspection	238 (31%)	348 (45%)	184 (24%)
Hair inspection and/or palpation	133 (17%)	378 (49%)	257 (33%)
Nail inspection and/or palpation	149 (19%)	382 (50%)	237 (31%)
Mole detection	155 (20%)	385 (51%)	223 (29%)

Table 9: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Peripheral Vascular

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Pulse strength grading	85 (11%)	425 (55%)	259 (34%)
Peripheral edema inspection or palpation	222 (29%)	366 (48%)	182 (24%)
Ankle-brachial index measurement	66 (9%)	420 (55%)	279 (36%)

Table 10: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Neurological

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Cranial nerves testing	23 (3%)	373 (49%)	372 (48%)
Muscle strength testing	36 (5%)	378 (49%)	354 (46%)
Coordination testing	37 (5%)	390 (51%)	339 (44%)
Pain sensation testing	56 (7%)	391 (51%)	321 (42%)
Temperature sensation testing	44 (6%)	376 (49%)	348 (45%)
Light touch sensation testing	46 (6%)	369 (48%)	353 (46%)
Proprioception (Position) testing	27 (4%)	354 (46%)	385 (50%)
Vibration sensation testing	34 (4%)	344 (45%)	391 (51%)
Discriminative sensations testing	26 (3%)	340 (44%)	403 (52%)
Deep tendon reflexes testing	27 (4%)	359 (47%)	383 (50%)
Abdominal reflexes testing	17 (2%)	352 (46%)	400 (52%)
Plantar response testing	19 (2%)	349 (45%)	400 (52%)
Anal reflex testing	10 (1%)	330 (43%)	424 (56%)
Meningeal signs testing	34 (4%)	367 (48%)	369 (48%)
Lumbosacral radiculopathy testing	16 (2%)	338 (44%)	413 (54%)
Testing for asterixis	28 (4%)	329 (43%)	407 (53%)
Testing for winging of the scapula	15 (2%)	319 (42%)	424 (56%)

Table 11: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Mental Status

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Appearance and behavior assessment	283 (37%)	350 (46%)	136 (18%)
Speech and language assessment	210 (27%)	380 (49%)	179 (23%)
Mood assessment	210 (27%)	377 (49%)	181 (24%)
Thoughts and perceptions assessment	167 (22%)	388 (51%)	211 (28%)
Cognitive function testing	198 (26%)	387 (50%)	182 (24%)
Mini-mental status exam	174 (23%)	374 (49%)	216 (28%)

Table 12: Patient Assessment Skills Pertinent to Practicing Pharmacists Survey Responses – Other

Patient assessment item	Need to understand AND be able to perform # of respondents (%)	Need to understand only # of respondents (%)	NOT need to understand or be able to perform # of respondents (%)
Monofilament test (diabetic foot exam)	266 (35%)	318 (41%)	183 (24%)
Point of care testing	442 (57%)	253 (33%)	75 (10%)
Homan's sign	59 (8%)	368 (48%)	337 (44%)
Digital rectal exam	14 (2%)	403 (53%)	350 (46%)
Testicular self-examination instruction	104 (14%)	418 (54%)	246 (32%)
Breast self-examination instruction	125 (16%)	444 (58%)	201 (26%)