Physician Attitudes Toward Pharmacist-Run Anticoagulation Clinics in Department of Defense Health Services Region 5

Eric A. Shalita, Peter D. Hurd, John D. James, Carl J. Tullio, and Cynthia A. Wuller

ABSTRACT: The objective of the study was to determine physician attitudes toward pharmacist-run anticoagulation clinics in the Department of Defense Health Services Region 5. All active-duty military physicians (208 total) in eight medical specialties serving in the region's health care facilities were surveyed, using Likert scales to quantify their responses. The survey, which received a 67% response rate (n=138), measured various attitudes regarding expanded roles for pharmacists and nonpharmacist health care providers as well as physician training location demographics.

Based on the survey results, three of the four hypotheses were supported by the survey data. The study concludes that physicians who have experi-

ence with pharmacist-run anticoagulation clinics have very favorable attitudes toward them and feel that such clinics are assets to a multidisciplinary health care team. These attitudes appear to be universal within the study population and not related to the geographic location of training.

KEY WORDS: Health Service Region 5, Medical treatment facility, Anticoagulation clinic, Pharmaceutical care, Pharmacist expanded roles

J Managed Care Pharm 1998; 4: 413-419.

The pharmacy profession is undergoing a period of tumultuous change as it attempts to redefine itself in the context of effective health care delivery, and to assure its place in the future of health care. Hepler¹ described the major forces shaping the profession of pharmacy as social values and institutions, technology, and economics. Since the early 1970s, pharmacy leaders have attempted to expand the role of the pharmacist in the delivery of comprehensive health care. A recent editorial by Trinquet² comments that the profession is still grappling with many changes, including health care reform, "clinical pharmacy," the entry-level Pharm.D. degree, the decline of independent community pharmacies, and the growth of managed care.

Many changes have occurred in pharmacy concurrent with changes in health care. For example, one study conducted in 1978 indicated that pharmacists spent 61% of their time on dispensing and patient care activities, such as receiving, processing, and assessing the appropriateness of medication orders; only about 6% of their time was spent on patient education. In 1994, the amount of time pharmacists spent dispensing declined to 55%, while the amount of time spent providing education, information, and medication management increased to 21%.³ As this shift away from the traditional dispensing role continues, the profession will have to remodel itself into a new context with a more defined role. Pharmacists, sometimes seen by the public as merely the purveyors of medicinal products, must continue their efforts to become valuable members of the health care team. Pharmaceutical care is the vehicle for the redefinition of the pharmacy profession.⁴

The military is, and has been for many years, one of the largest managed health care systems in the United States.

AUTHORS

MAJOR ERIC A. SHALITA, R.Ph., M.S., is Diagnostics and Therapeutics Flight Commander and Chief, Pharmacy Services, 35th Medical Group, Misawa Air Base, Japan; PETER D. HURD, Ph.D., is Division Director and Professor of Pharmacy Administration, St. Louis College of Pharmacy, St. Louis, MO; MAJOR JOHN D. JAMES, M.B.A., PHARM.D., is Pharmacy Flight Commander, 56th Medical Group, Luke Air Force Base, AZ; CARL J. TULLIO, R.Ph., M.S., is Clinical Pharmacist, McDonald Army Community Hospital, Fort Eustis, VA; CYNTHIA A. WULLER, R.Ph., M.S., is Assistant Professor of Pharmacy Practice, St. Louis College of Pharmacy, St. Louis, MO.

AUTHOR CORRESPONDENCE: Major Eric A. Shalita, R.Ph., M.S., Diagnostics and Therapeutics Flight Commander, Chief, Pharmacy Services, 35 MDSS/SGSAP, APO AP 96319.

ACKNOWLEDGMENT: The authors wish to thank Kenneth W. Schafermeyer, Ph.D., Associate Professor of Pharmacy Administration, St. Louis College of Pharmacy, for his invaluable assistance. The views presented here are those of the authors and do not necessarily reflect those of the U.S. Air Force or Department of Defense.

Copyright © 1998 Academy of Managed Care Pharmacy, Inc. All rights reserved.

However, only recently have pharmacists begun practicing outside of the dispensing pharmacy. Many pharmacy departments now are implementing the pharmaceutical care model. At Scott Air Force Base (AFB), a team effort is being used to bring the pharmaceutical care model to patients. Since 1994, the pharmacy department has provided diabetic education and obtained charting privileges for all assigned pharmacists, started an asthma clinic with the pediatrics department, participated in medication teaching rounds in the Family Practice Residency program, and established a Geriatric Medication Reduction Clinic with the Family Practice Residency program. The high-water mark of this department's transition came with the transfer of responsibility for the hospital's Outpatient Anticoagulation Clinic from the department of internal medicine to the pharmacy department.⁵

Appropriately trained anticoagulation clinic pharmacists have clinical privileges under protocol and monitor approximately 90 to 100 patients per week. Physicians initially resisted this expansion of pharmacist authority because they feared that pharmacists were encroaching on their areas of responsibility. This is not an unusual response and is discussed in the literature.⁶ Over time, the pharmacy department has proved itself to be an extremely capable provider of health care to this patient population.

The objective of this research was to investigate physician attitudes toward the role of pharmacists in outpatient anticoagulation clinics. Are there differences in attitudes? If so, why? Variables that may affect physicians' attitudes toward expanded roles for pharmacists include the physicians' practice experience, length of time in practice, and location of training experiences.

Because attitudes are intangible and must be inferred, they are difficult to measure. Measurements that use open-ended questions may be less than fully reliable, because the same person may answer the same question differently on different days. An accepted method of measurement is the Likert scale, which consists of a set of statements accompanied by a scale indicating the degree of agreement or disagreement.

LITERATURE REVIEW

Articles on the role of clinical pharmacists written in the 1970s revealed mixed attitudes in physicians' perceptions of pharmacists and their expanded roles. Some physicians, particularly younger ones (i.e., those in practice less than 10 years), had a more favorable attitude toward expanded roles for pharmacists and were more apt to seek them out as a source of information. This was not as true for older physicians, many of whom still espoused superiority. Hall⁷ and Dodds⁸ agreed that the time had come for pharmacists to seize the opportunity to expand their roles in health care.

In the 1980s, Johnson⁹ suggested that attitudes remained similar; however, the literature reveals references to positive attitudes not only from younger physicians but also from those who had experience working with clinical pharmacists.

While these attitudes seemed encouraging, they carried a caveat of their own: Physicians favored expanded roles for pharmacists, but not too expanded. In any area that even remotely appeared to encroach on a physician's practice, such as screenings, treatment, or diagnostic roles, physicians opposed such role expansions.¹⁰ Toward the end of the 1980s, Weiss¹¹ and Epstein¹² quoted several sobering studies indicating that physicians still felt the most important function of the pharmacist was filling prescriptions, and everything else was superfluous.

By the 1990s, the pharmacy practice focus had shifted further. According to Spencer,¹³ while many physicians still thought that pharmacists should "stick to dispensing," others felt that the time had come to expand the clinical roles of pharmacists. The study indicated that the area in greatest need of improvement was collaborative communication. Increased communication between pharmacists and physicians would go a long way toward solidifying the goals of the pharmacy profession.¹⁴ However, much of this literature comes from Great Britain, where the relationship between physician and pharmacist does not appear to be as developed as in the United States.

Most of the recent literature discusses the effects of managed health care, pharmaceutical care, and interdisciplinary models such as the patient-focused care model, as well as pharmacist prescribing under protocol.¹⁵ Anticoagulation clinics are prime examples of this type of protocol-driven service.

Pharmacists have been involved with anticoagulation clinics since 1974, some having been managed by a single pharmacist since 1977. These types of clinics are more often affiliated with the Veterans Administration hospitals or large teaching hospitals associated with universities.^{16,17} Garabedian-Ruffalo and Gray¹⁸ reported that pharmacists are highly effective in the management of anticoagulant clinics.

By the mid-1990s, physicians had begun to accept pharmacist management in anticoagulation clinics as a part of clinical pharmacy practice.¹⁹ This acceptance is attributed to the establishment of protocols outlining clinic practice. The consensus also exists that patient management within treatment protocols enhances pharmacy practice and maximizes the pharmacist's use of his/her knowledge. Hall²⁰ maintains that if pharmacists demonstrate competency in a particular area, physicians are more likely to favorably view the pharmacist in that clinical role. These facts support the activities at Scott AFB Medical Center's anticoagulation clinic.

In this study, the following hypotheses were tested:

Hypothesis I: Physicians assigned to military treatment facilities who are newer to practice (10 years or less in practice) have a more positive attitude toward pharmacist-run anticoagulation clinics than do physicians who have practiced more than 10 years.

Hypothesis II: Physicians assigned to military treatment facilities who have experience with pharmacist-run anticoagulation clinics have a more positive attitude toward such clinics than do physicians without such experience.

Hypothesis III: Physician attitudes toward pharmacist-run anticoagulation clinics vary according to the region of the country in which the physician was trained.

Hypothesis IV: Physician support of pharmacist-run anticoagulation clinics positively correlates with physician support of pharmacist involvement in multidisciplinary patient care services.

METHODOLOGY

Subjects

The study population consisted of all active-duty military physicians assigned to Medical Treatment Facilities (MTFs) in the Department of Defense (DoD) Health Systems Region 5 in the following specialties: internal medicine, including cardiology, endocrinology, hematology, nephrology, and pulmonology; orthopedics; and family practice. These physicians were selected because they were more likely to utilize an anticoagulant in the scope of their practice and may have had experience with an anticoagulant clinic administered by a nonphysician.

The military bases included in the study were Wright-Patterson AFB, Ohio; Scott AFB, Illinois; Great Lakes Naval Hospital, Illinois; Fort Knox, Kentucky (Army); and Fort Campbell, Kentucky (Army).

Procedures

The clinical pharmacist or department chairperson at each military hospital provided a list of physician providers, which was used to determine population size at each facility and later to identify nonrespondents. The initial set of surveys was delivered to a pharmacist at each facility. These pharmacists then hand-delivered the surveys to the individual physi-

cians. Each survey was accompanied by a self-addressed, stamped envelope, coded for identification. The study population was grouped by base. Nonrespondents received follow-ups three weeks after the initial solicitation.

Six physicians in the 375th Medical Group, Scott AFB, Illinois, participated in a pilot study of the survey instrument to test its face validity (i.e., that the survey instrument says what the designer intended). This pilot study demonstrated face validity, and no changes were required before distribution to the study population.

Internal validity was established by the correlation of two pairs of survey questions: Question 3, "A pharmacist-run anticoagulation clinic is an asset to a managed health care setting," and question 5, "All aspects (initiation, monitoring, dose adjustments, and discontinuation) of anticoagulation therapy should be the sole responsibility of the patient's primary physician," negatively correlated ($n=138$; $r=-0.294$; $p<0.01$). Question 4, "My experiences with pharmacist-run anticoagulation clinics have been positive," and question 11, "A pharmacist-run anticoagulation clinic supports multidisciplinary patient care," positively correlated ($n=57$; $r=0.561$; $p<0.01$). Because 57 of 138 respondents had experience with pharmacist-run anticoagulation clinics, the n in questions 4 and 47 was 57 rather than 138. This subgroup provided the most meaningful results.

Statistical Analysis

A survey instrument using a seven-point Likert scale was designed to test the hypotheses. Information from the survey was divided into three sections: 1) demographic data; 2) experience with anticoagulation clinics; and 3) attitudes toward pharmacist-run anticoagulation services.

Table 1. Hypothesis and Survey Analysis

Hypothesis	Survey Question	Rationale	Statistical Test Used
I	Demographics: Year of graduation Questions 3,5	Questions should correlate: Question 3: Positive; Question 5: Negative	Correlation ANOVA compares <10 & >10 years
II	Independent variable Question 4 Dependent variable Questions: 2,3,5,6,7,9,11,12	Question 4 gives physician experience (Yes/No) Dependent variable questions give attitudes	ANOVA compares Yes & No groups with dependent variable questions
III	Demographics: Training Question 3	Training should be near normal distribution Question 3 should be positive	Univariate statistics* ANOVA between geographic groups
IV	Questions 4,11	Answers should positively correlate	Correlation
Validity	Questions 3,5 Questions 4,11	Answers should negatively correlate Answers should positively correlate	Internal Internal

*Univariate statistics is the term used by the statistics program for mean, median, and standard deviation.
The statistical analysis program used is MicroCase Version 2.11.

Table 2. Mean Score of Survey Questions

Survey Question	Mean±SD	n
1. A nonphysician, nonpharmacist health care professional (with appropriate training), under protocol and with physician oversight, can adequately monitor and maintain a patient's anticoagulation therapy in an outpatient setting.	2.949 "1.842	138
2. A pharmacist (with appropriate training), under protocol and with physician oversight, can adequately monitor and maintain a patient's anticoagulation therapy in an outpatient setting.	1.920 "1.196	138
3. A pharmacist-run anticoagulation clinic is an asset to a managed health care setting.	2.268 "1.337	138
4. My experience with pharmacist-run anticoagulation clinics has been positive. (0=Not Applicable, n=81)	0.652 "0.956 1.579 "0.865	138 57
5. All aspects (initiation, monitoring, dose adjustments, and discontinuation) of anticoagulation therapy should be the sole responsibility of the patient's primary physician.	4.862 "1.722	138
6. Properly trained pharmacists should be authorized to make independent dosage adjustments, under protocol, in routine (nonalert) value, international normalized ratio (INR) <4.00 cases.	2.333 "1.452	138
7. Properly trained pharmacists should be authorized to make independent dosage adjustments, under protocol, on alert value INR >4.00 cases.	4.051 "1.830	138
8. Properly trained nonphysician, nonpharmacist health care professionals should be authorized to make independent dosage adjustments, under protocol, on alert value INR >4.00 cases.	5.145 "1.770	138
9. Properly trained pharmacists should be authorized to sign prescriptions for Coumadin [®] refills within the scope of the anticoagulation clinic protocols.	3.094 "1.948	138
10. Properly trained nonphysician, nonpharmacist health care professionals should be authorized to sign prescriptions for Coumadin [®] refills within the scope of the anticoagulation clinic.	4.471 "2.062	138
11. A pharmacist-run anticoagulation clinic supports multidisciplinary patient care.	2.210 "1.136	138
12. A pharmacist-run anticoagulation clinic infringes on physician control of patient management.	5.167 "1.550	138
Question scales are 1=Strongly Agree; 7=Strongly Disagree Question 4 relates to physicians who have experience with pharmacist-run anticoagulation clinics (n=57).		

RESULTS

The data were tested with univariate statistics (mean and standard deviation), correlation, and analysis of variance (ANOVA). After analysis using a sample table from Schott,²¹ the study was powered at 95% and was designed to detect moderate differences when $p < 0.05$.

Statistical tests were run using the MicroCase Version 2.11 and StatPac Gold statistical analysis packages. Table 1 describes the rationale and statistical tests for each hypothesis. Two hundred eight (208) physicians were surveyed and 138, or 67%, responded. Results from the survey questions are listed in Table 2, and respondent demographics are listed in Table 3.

DISCUSSION

Hypothesis I

Physicians assigned to military treatment facilities who are newer to practice (10 years or less in practice) have a more positive attitude toward pharmacist-run anticoagulation clinics

than do physicians who have practiced more than 10 years.

This hypothesis was tested comparing responses to two survey questions and demographic data. Comparing responses from those physicians who were in practice less than 10 years with those practicing for 10 years or more yielded the results listed in Tables 4 and 5.

ANOVA tests were performed on this data and supported the stated hypothesis. Both physician groups viewed pharmacist-run anticoagulation clinics favorably. Older physicians were more resistant to pharmacists performing clinical functions (management of anticoagulation therapy) than were physicians who were newer to practice. This fact could be attributed to different training methods and philosophies or to the physicians' own personal experiences with pharmacists.

The results were somewhat different on the subject of control over the patient for whom the physician has ultimate responsibility. The more experienced physician felt more strongly that the physician should control all aspects of anticoagulation therapy than did the physician with less than 10 years' experience. The results are statistically significant ($p < 0.05$) and may indicate a philosophical difference between

Table 3. Physician Demographics

Years of Military Service	n (%)
10 years or less	103 (74.64%)
Greater than 10 years	35 (25.36%)
Location of Medical Training	
Northeast	46 (33.33%)
Midwest	40 (28.99%)
South	34 (24.64%)
Southwest	3 (2.17%)
West coast	15 (10.87%)

these two groups of physicians. Overall, surveyed physicians see the pharmacist-run clinic as an asset to this system. This attitude applies to all physicians surveyed, regardless of length of practice. The data support the first hypothesis.

Hypothesis II

Physicians assigned to military treatment facilities who have experience with pharmacist-run anticoagulation clinics have a more positive attitude toward such clinics than do physicians without this experience.

To appropriately address this hypothesis, the study population was grouped according to responses to attitude question 4. Group One (n=81) consisted of physicians without experience of pharmacist-run anticoagulation clinics. Group Two (n=57) consisted of physicians with experience of such clinics. Each of the eight survey questions used for this hypothesis relates to general attitudes toward various aspects of pharmacist-run anticoagulation clinics.

The responses from each group to the questions are compared in Table 6. Each answer indicates general support for the hypothesis; however, none of the questions reveal statistical significance. This hypothesis was supported by the data.

While the data from each question support the stated hypothesis, testing this hypothesis would have been easier with a single question such as, "I feel that a pharmacist-run

anticoagulation clinic is a good idea." Unfortunately, the weakness of this approach was not realized until after the data collection phase of this project.

Hypothesis III

Physician attitudes toward pharmacist-run anticoagulation clinics vary according to the region of the country in which the physician was trained.

This hypothesis was tested using univariate statistics (mean, standard deviation) and an ANOVA on the demographics section of the survey comparing each geographic group's answers to attitude question 3. The data, listed in Table 7, indicate positive attitudes regardless of training location.

This hypothesis examined the influence of medical training on physician attitudes toward pharmacist-run anticoagulation clinics by dividing the study population according to geographic location of residency sites. Respondents not indicating a residency location were listed at their medical schools.

The results to this question were relatively uniform for all locations. Analysis of the data did not indicate a significant difference between groups. This hypothesis was not supported.

Hypothesis IV

Physician support of pharmacist-run anticoagulation clinics positively correlates with physician support of pharmacist involvement in multidisciplinary patient care services.

This hypothesis used univariate statistics (mean, standard deviation) and correlation on a modified subpopulation of the study group. The questions examined for this hypothesis were attitude questions 4 and 11. Data to support this hypothesis were derived from respondents who did not answer 0 (Not Applicable) to question 4. The mean was 1.579 ($s \pm 0.865$, $n=57$), adjusted to discount respondents who answered 0 (Not Applicable) ($n=81$). This hypothesis is applicable only to those physicians who had experience with pharmacist-run anticoagulation clinics.

Attitude question 11 yielded a mean of 2.210 ($s \pm 1.136$, $n=138$), indicating a favorable physician attitude. A correlation between the two questions using the subpopulation of physicians who have experience with pharmacist-run anticoagulation clinics indicated a statistically significant result: $r=0.561$ ($p < 0.01$). This response indicates that physicians who have experience with these clinics have a much more favorable attitude toward them than do their colleagues without such experience.

If pharmacists continue to expand their role as vital members of the health care team, physicians must accept pharmacists in new medical roles. One area in which pharmacists have significantly expanded their roles is in managing anticoagulation clinics. If the physician accepts a pharmacist in this important role, the physician should accept

Table 4. Question 3 Responses: Physician Attitude by Years of Practice

Category	Mean	Standard Deviation
<10 years (n=103)	2.16	1.23
10 or more years (n=35)	2.60	1.58

Question 3: A pharmacist-run anticoagulation clinic is an asset to a managed health care setting.

1=Strongly Agree; 7=Strongly Disagree

Table 5. Question 5 Responses: Physician Attitude by Years of Practice

Category	Mean	Standard Deviation
<10 years (n=103)	5.05	1.47
10 or more years (n=35)	4.31	2.25

Question 5: All aspects of anticoagulation therapy should be the sole responsibility of the patient's primary physicians.

1=Strongly Agree; 7=Strongly Disagree

the pharmacist as a member of the multidisciplinary health care team. However, this attitude may be directly related to the extent and quality of experience a physician has had with pharmacist-run anticoagulation clinics. When the data from all respondents were analyzed (n=138), the correlation was negative ($r = -0.107$). Even though this result is not statistically significant, it raises some interesting questions, not the least of which is: What really determines physician attitudes?

The results of the survey show that physicians who have experience with pharmacist-run anticoagulation clinics have very positive experiences. This suggests that pharmacists who want to expand their roles into highly beneficial patient care areas may want to consider anticoagulation clinics. The data from the subpopulation of physicians strongly supports the hypothesis.

LIMITATIONS

Only physicians assigned to DoD medical treatment facilities are included in the population, and the number of physicians in this group is small (n=208). Traditionally, physicians who treat the majority of patients are junior in grade and experience, which means the population of older physicians (those with more than 10 years in practice) is

Table 6. Physician Attitudes Toward Pharmacist-Run Anticoagulation Clinics: Comparison of Physicians With and Without Experience of These Clinics

Question Number	No Experience Mean Value	Experience Mean Value	Statistically Significant	Supports Hypothesis
2	2.19	1.26	NO	YES
3	2.80	1.50	NO	YES
5	4.74	5.03	NO	YES
6	2.72	1.79	NO	YES
7	4.22	3.81	NO	YES
9	3.33	2.76	NO	YES
11	2.52	1.77	NO	YES
12	5.01	5.38	NO	YES

smaller than the population of younger physicians. The results may be biased, which would limit the generalization of this study. However, this study was de-signed for a physician to answer questions about physician attitudes toward pharmacists, not senior officer attitudes toward junior officers. For this reason, this study may be applicable to any health care arena in which pharmacists are attempting to expand their clinical privileges.

Because this study was designed by a pharmacist who manages an anticoagulation clinic, the study may have an inadvertent bias toward pharmacists compared to other health care professionals providing these same services. This survey was mailed anonymously and did not include face-to-face or telephone interviews. Therefore, answers were limited, and any undetected ambiguity in the survey may influence the results. We could not be assured of 100% contact of nonrespondents. Other questions could have been asked more specifically. Although this is a possible weakness, it should not have affected results.

One strong point of the project was the high survey response rate (67%). Even though the number of physicians surveyed was small, the response rate lends validity to the results.

IMPLICATIONS

What do these results mean for the future? This project has possible implications in three areas: DoD, civilian managed care organizations (MCOs), and private medical practice.

Department of Defense

Because this project involved all service components of the military medical system and showed no attitude differences related to geographical region of training, this project has wide applicability in the federal services.

Anticoagulation clinics are increasing in number throughout the Department of Defense, and many are administered by pharmacists. Pharmacist-run anticoagulation clinics are cost effective and may provide a partial solution to dwindling access to the military health care system. When physicians do not have to dedicate office time to patients requiring only a lab test and dosage adjustment, appointment slots open and access to the system improves for all patients.

Civilian Managed Care Organizations

Like the military medical system, MCOs have a set beneficiary population and member pharmacies, control health care resources, and also may have contract laboratories. A model for pharmacist-run anticoagulation clinics in civilian MCOs, similar to the military system, may save health care dollars.

Private Medical Practice

Pharmacist-run anticoagulation clinics have been tested in private medical settings around the country. The primary

Table 7. Question 11 Responses: Physician Attitude by Geographic Location of Training

Category	Mean	Standard Deviation
Northeast (n=46)	2.39	1.20
Midwest (n=40)	1.80	1.11
South (n=34)	2.56	1.67
Southwest (n=3)	2.67	1.15
West coast (n=15)	2.40	1.30

Question 11: A pharmacist-run anticoagulation clinic is an asset to a managed health care setting.

1=Strongly Agree; 7=Strongly Disagree

obstacle to expanding these clinics lies in persuading civilian physicians in private practice to allow pharmacists to control dosing algorithms and to abide by the clinical decision of the pharmacist. Once the physician's view of the pharmacist as a mere dispenser of medication is overcome, this type of advanced ambulatory practice can become more common.

CONCLUSIONS

Physicians generally have favorable attitudes toward pharmacist-run anticoagulation clinics. Physicians who have practiced for fewer than 10 years appear to have a more positive attitude toward pharmacists managing anticoagulation therapy than do their more experienced colleagues. This finding may result from shifting attitudes among physicians toward pharmacists and their place on the health care team. Younger physicians also are less likely to feel that they must control all aspects of their patient's anticoagulation therapy. Again, this is a display of confidence in the pharmacist's clinical skills. Physicians who have experience with pharmacist-run anticoagulation clinics have very favorable attitudes toward them, which may indicate that confidence in such clinics arises from direct experience. Physicians who have never taken advantage of this aspect of pharmaceutical care may be wary of the unknown. Physicians also seem to be more comfortable with granting increased privileges to pharmacists compared to other nonphysician providers. These attitudes seem to be universal within the study population and are not related to geographic location of training. This particular population has never been

surveyed regarding pharmacists' expanded roles in anticoagulation clinics, and this data will be useful in supporting existing literature. This project was submitted to the Graduate Faculty of the St. Louis College of Pharmacy in partial fulfillment of the requirements for the degree Master of Science in Pharmacy Administration.

References

1. Hepler CD. Unresolved issues in the future of pharmacy. *Am J Hosp Pharm* 1988; 45: 1071-81.
2. Trinque RL. Mistakes pharmacists make and why. *J Pharm Prac* 1995; 8(2): 70-82.
3. Trinca CE. The pharmacist's progress toward implementing pharmaceutical care. The Third Strategic Planning Conference for Pharmacy Practice. *Am Pharm* 1995; (Suppl): 13-18.
4. Pierpaoli PG. An iconoclastic perspective on progress in pharmacy practice. Harvey AK Whitney Lecture. *Am J Health-Syst Pharm* 1995; 52: 1763-70.
5. Shalita EA. Pharmacists without walls. *J Air Force Pharm* 1994; 2: 58.
6. Strickland DA. Pharmacists encroaching on care. *Medical World News* 1991(Jan): 42.
7. Hall KW, Parker WA. Physician's view of the pharmacist's professional role. *Can Pharm J* 1976(Oct): 311-14.
8. Dodds AW, Archambault GF. The clinical pharmacist's role. *Drug Intell Clin Pharm* 1979; 13: 290-92.
9. Johnson RE, Freeborn DK, et al. Physicians' attitudes toward an expanded role for pharmacists in an HMO. *Group Health J* 1984(Fall): 14-21.
10. Ortiz M, Walker WL, et al. Physicians—friend or foe? *J Soc and Admin Pharm* 1989; 6; 2: 59-68.
11. Weiss B. Larger pharmacist role worrying doctors these days. *Drug Topics* 1986(Nov): 30.
12. Epstein D. Physicians see pharmacists as "pill dispensers": schering. *Drug Topics* 1989(Sep); 4: 14-15.
13. Spencer JA, Edwards C. Pharmacy beyond the dispensary: general practitioner's views. *BMJ* 1992; 304: 1670-72.
14. Sutters CA, Nathan A. The community pharmacist's role: GPIs and pharmacists' attitudes toward collaboration. *J Soc and Admin Pharm* 1993; 10(2): 70-84.
15. Webb CE. Prescribing medications: changing the paradigm for a changing health care system. *Am J Health-Syst Pharm* 1995; 52: 1693-95.
16. Nappi JM. Measuring the effectiveness of an anticoagulation clinic managed by a pharmacist. *Wisc Pharm* 1980(Jun): 164-68.
17. Conte RR, Kehoe WA, et al. Nine-year experience with a pharmacist-managed anticoagulation clinic. *Am J Hosp Pharm* 1986; 43: 2460-64.
18. Garabedian-Ruffalo SM, Gray DR, et al. Retrospective evaluation of a pharmacist-managed warfarin anticoagulation clinic. *Am J Hosp Pharm* 1985; 42: 304-08.
19. Radley AS, Hall J. The establishment and evaluation of a pharmacist-developed anticoagulation clinic. *Pharm J* 1994(Jan); 252: 91-92.
20. Hall J, Radley AS. A role for community pharmacists in the control of anticoagulant therapy. *Pharm J* 1994(Feb); 252: 230-32.
21. Schott S. Statistics for health professionals 1990; Appendix A: 347-49.