

# Comparison of Drug Information Course Curricula in Schools and Colleges of Pharmacy<sup>1,2</sup>

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The purpose of this study was to determine the presence of drug information courses in schools and colleges of pharmacy and then to compare these courses in the areas of content and organization. Data was compiled from a survey mailed in October 1993 to 74 schools and colleges of pharmacy located in the United States. Sixty-six schools (89.2 percent) responded. Fifty-six of the schools stated that they offered a separate required or elective drug information course for pharmacy students. Of those schools which responded to the survey, 22 (41.5 percent) required the course for their BS students; 22 (55 percent) required the course for their post-BS students; and 25 (71.4 percent) required a separate drug information course for their entry-level PharmD students. The amount of time devoted to specific drug information course topics was variable. The results of this survey suggested that many pharmacy students may not have had the opportunity to gain experience in drug information

## INTRODUCTION

All pharmacists will be called upon at some point in their practice to be providers of drug information(1). As vital members of the health care team, pharmacists are involved in drug therapy decisions. Physicians, nurses, and other health professionals realize the pharmacist's role as a provider of drug information and often, the frequency of utilization of the pharmacist depends on his ability to successfully search the literature and provide reliable information(1,2). In addition, today's patients are demanding that the pharmacist provide more information about drug effects and potential adverse reactions(2). Due to the changing role of the pharmacist and the increasing demand for drug information by peers, fellow health professionals, and the general public, it is important that pharmacy students be given an opportunity to acquire the knowledge of how to utilize the available medical literature(2-5). Specifically, the students need to understand how to select appropriate literature sources; be able to critically evaluate the literature; and finally be able to apply this information to patient care. This knowledge will not only provide a foundation for the drug information skills required of a pharmacist but may also enhance and simplify other pharmacy course work(5).

Various studies have been conducted in the past to determine the level of formalized didactic and experiential drug information instruction which exist in schools and colleges of pharmacy(3,6-8). In 1982, Kirschenbaum and Rosenberg conducted a survey to determine the scope of drug information educational programs offered by 109 for-

malized drug information centers and 67 colleges of pharmacy in the U.S.(6). Sixty-three colleges of pharmacy responded that they provided required and/or elective didactic or experiential drug information training for their students. Thirty-two colleges stated that limited training (often fewer than 40 hours) in drug information was a required component of the baccalaureate externship/clerkship. It was concluded that many pharmacy students may not be receiving sufficient drug information training. An international study by Hartzema *et al.*(3) uncovered major barriers toward further implementation of drug information courses. Nineteen different countries worldwide responded to the survey and reported that available resources in faculty and educational materials and competition for credit hours in already overloaded curricula were major barriers to drug information course implementation. Other surveys have been conducted to evaluate the formalized training and experience in drug information in colleges of pharmacy in the United States(7,8). In addition, specific accounts of drug information programs offered in schools and colleges of pharmacy can be found in the literature. These accounts often included information regarding the students to whom the programs are offered, the course topics discussed, and sample course outlines(1,2,4,5,9-13). Consensus goals for an

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**Table I. Recommended didactic component subject areas<sup>a</sup>**

- I. History and Philosophy of Drug Information Services
- II. The Biomedical Publication Process
- III. Systematic Approach to Handling Drug Information Request
- IV. Drug Literature Evaluation
- V. Adverse Event Management
- VI. Drug Policy Management
- VII. The Drug Approval Process
- VIII. Keeping Current with the Literature
- IX. Ethical and Legal Issues
- X. Drug Information Quality Assurance

<sup>a</sup>See ref. #14.

ideal drug information course were developed by Troutman and other drug information instructors at a 1991 conference held at the University of New Mexico. An overview of the major subject areas developed by Troutman and colleagues are listed in Table I(14).

The purpose of the current study was to compile data regarding the drug information course curricula of the schools and colleges of pharmacy in the United States. In addition to course content, the area of course organization (credit hours received, course director title, etc.) was also addressed. The compilation of current practices nationwide will permit colleges of pharmacy to assess their programs against the national averages. No attempt was made to compare or assess experiential drug information clerkships offered or required by schools and colleges of pharmacy.

#### METHODS

Initially, drug information course topics and questionnaire areas of interest were obtained from analysis of reports in the literature of existing drug information programs(1,2,4,5,9-12,15,16). In addition, topics of interest were obtained from a drug information course syllabus, and the current and past directors of the Drug Information Center at a school of pharmacy in the southeastern United States. These areas of interest were compiled and evaluated regarding their potential for inclusion in a nationwide survey of schools and colleges of pharmacy. Once developed, the proposed survey was shown informally to members of the clinical and administrative staff of the school of pharmacy for their comments and suggestions. The comments received were then incorporated into a revised survey instrument.<sup>5</sup>

The revised questionnaire consisted of 36 multiple choice and fill-in-the-blank questions which addressed the areas of course organization and content. Survey participants were selected from the 1993-1994 *American Association of Colleges of Pharmacy (AACCP) Roster*(17). The chairpersons of the departments of pharmacy practice of the 74 schools and colleges of pharmacy listed in the *Roster*(17) were sent an individually signed cover letter requesting participation in the survey and a copy of the survey instrument with instruction to return it postage-paid. The questionnaires were marked with an identification code to permit a follow-up

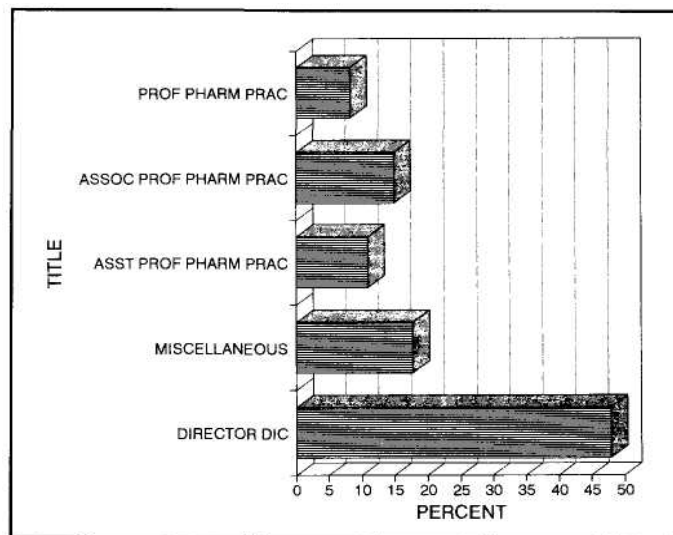


Fig. 1. Drug information course director title.

mailing to non-responders. In November 1993, 21 follow-up letters were mailed to those schools which had not responded during the first three week response period. The overall response rate of the survey was 66 (89.2 percent). Survey results were entered into a computerized spreadsheet (Quattro Pro™ 4.0) for data management and the preparation of graphics, etc.

#### RESULTS

Thirty-nine (59.1 percent) of the returned surveys were answered by the course director of the institution's drug information course; 24 (61.5 percent) of these individuals were also the director of a drug information center. Of the other responders, 20 (30.3 percent) were chairmen of their department of pharmacy practice, three (4.5 percent) were directors of a drug information center, and the remaining four (6.1 percent) respondents held miscellaneous pharmacy titles.

Of those responding, approximately 56 (85 percent) stated that they did offer a separate drug information course at their institution. Some of the reasons given by the 10 (15.2 percent) participants which indicated that they did not offer a separate drug information course were: lack of faculty and time to teach the course, and inclusion of drug information instruction within other courses or clerkships offered at their institution. No attempt was made to uncover specific course titles or clerkships in which drug information instruction was included.

Fifty-three responding institutions offered a bachelors degree in pharmacy; 40 offered a post-BS PharmD degree; and 35 offered an entry-level PharmD degree. Of these, 29 (54.7 percent) offered a separate drug information course to their BS students, 27 (67.5 percent) offered the course for their post-BS PharmD students, and 25 (71.4 percent) stated that they offered a separate course in drug information to their entry-level PharmD students. For those schools which responded to the survey, 22 (41.5 percent) required the course for their BS students; 22 (55 percent) required the course for their post-BS students; and 25 (71.4 percent) required the course for their entry-level PharmD students.

Semester hours earned for the course ranged from one to four hours for all degree programs. The average number of semester hours was  $2.3 \pm 0.59$  with the largest group, 26

<sup>4</sup>A copy of the survey instrument may be obtained from the corresponding author

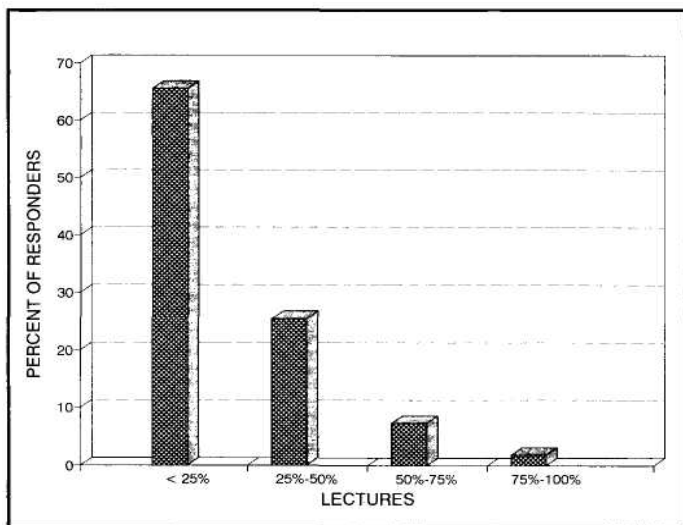


Fig. 2. Lectures by persons other than the course director (n=55).

schools (59.1 percent), awarding two hours credit. Three institutions indicated that they assigned a different number of semester hours for the course depending on the degree program in which the student is enrolled. Twelve of the responding institutions were on the quarter hour credit system. Again the range was one to four quarter hours with an average of  $2.4 \pm 0.79$  quarter hours credit. Half of these respondents awarded two quarter hours for the course.

Forty-eight percent of respondents stated that the drug information course director was also the director of a drug information center (Figure 1). Some miscellaneous titles reported included assistant and associate director of a drug information center, librarian, and drug information specialist.

When asked how many lectures in the drug information course were taught by persons other than the course director, 36 (65.5 percent) of respondents indicated that less than 25 percent of lectures were given by guest lecturers (Figure 2).

Of those schools which offered a separate drug information course, approximately 34 (61 percent) had a drug information center. Of the 21 (37.5 percent) schools which did not have a drug information center, 12 (57.1 percent) indicated that their students did have access to a hospital affiliated drug information center in order to gain practical experience in drug information retrieval. Neither school affiliation nor population size of surrounding area appeared to influence the presence or absence of a drug information center at our respondents' universities.

Only 15 (26.8 percent) respondents indicated that a textbook or manual was required for the drug information course. Specific titles of textbooks utilized by 14 of the 15 respondents may be found in Table II. The low number of textbook users uncovered by this survey could be a result of the limited number of drug information texts that are available. Although not asked in the questionnaire, three respondents reported that they utilized an internally developed manual; however, the contents of these manuals were not revealed.

Nine (16 percent) of the respondents stated that audiovisual aids were used in their drug information course as instructional sources for self-study and one stated that they utilized self-study aids only for off-campus, non-traditional

Table II. Textbook titles (n=14)

Title	Percent	n <sup>a</sup>
Gehlbach, S.H., <i>Interpreting the Medical Literature</i>	50.0	7
Watanabe, A.S., <i>Principles of Drug Information Services</i>	14.3	2
Snow, B., <i>Drug Information: A Guide to Current Resources</i>	7.1	1
Dawson-Saunders, B., <i>Basic and Clinical Biostatistics</i>	14.3	2
Internally developed manual	21.4	3

<sup>a</sup>The total number will exceed 14 as one respondent used two textbooks for the course

Table III. Average number of lecture hours for each course topic

Topic	Lecture hours	
	n	Average
History of the Purpose and Development of Drug Information Centers	36	0.87
Career Opportunities for Drug Information Specialists	34	0.61
Efficient Search Strategies	44	2.75
Process of Pharmaceutical Literature Publication	41	1.79
Drug Approval Process	34	1.20
Types and Functions of Information Resources	45	2.89
Computerized Information Resources	40	2.21
Library Orientation	25	1.06
Communication Skills	39	2.51
Adverse Drug Reaction Reporting	38	1.36
Drug Utilization Evaluation	32	1.59
Study Design and Clinical Importance	43	5.07
Other Types of Information Sources (poison control centers, govt. agencies, etc.)	34	0.93
Statistical Methods	41	3.32

students. All participating schools which used self-study aids indicated that there was an instructor available to answer questions from students. Types and descriptions of audiovisual aids used were not requested in the survey.

The schools surveyed were asked to rank various topics according to emphasis placed on them in the drug information course, as well as provide the number of hours spent on these topics during lecture and laboratories. Unfortunately, the laboratory hours were not consistently provided by the respondents and therefore no generalizations could be made regarding laboratory or contact hours devoted to each topic. The average number of lecture hours devoted to each topic by those surveyed are listed in Table III. The survey partici-

**Table IV. Course topics strongly emphasized**

Course topic	Percent	n	Average number of lecture hours
Clinical Importance of Study Design	72.5	37	6.5
Efficient Search Strategies	61.5	32	3.1
Types and Functions of Information Resources	50.9	27	3.4
Oral and Written Communication Skills	47.1	24	3.8
Statistical Methods	44.2	23	5.4

pants were provided with a five point scale in order to rank the emphasis placed on various course topics, these ranking choices included Strongly Emphasized, Somewhat Emphasized, Included in the Course, Not Emphasized, and Not Included in the Course. Those topics ranking highest as Strongly Emphasized are listed in Table IV. Thirty-seven of the respondents indicated that evaluation of pharmaceutical literature in terms of study design and clinical importance were strongly emphasized with an average of 6.5 hours devoted to this topic in lecture. Approximately 62 percent of the respondents strongly emphasized efficient search strategies. Other topics ranking high in this category included discussion of various types and functions of information resources such as journals, handbooks, indexes, etc., effective oral and written communication skills, and the discussion of statistical methods commonly used to analyze data found in the pharmaceutical literature.

Surprisingly, 31 percent of respondents stated that they do not include the discussion of drug utilization evaluation in their drug information course. Other topics frequently cited as not included in the drug information course are discussion of career opportunities for drug information specialists and library orientation (Table V).

Topics ranking highest in the survey as Somewhat Emphasized included history of the purpose and development of drug information centers, description of the drug approval process, and discussion of other types of information sources such as government agencies, pharmaceutical industry, poison control centers, and self-help groups.

Topics reported to be Included but Not Emphasized in the course consisted of discussion of the process by which pharmaceutical literature is published and the discussion of computerized drug information sources.

## DISCUSSION

This study's design was developed prior to the publication of Troutman's consensus drug information curriculum for the year 2000(14). However, contrasting this study's results with the ideal curriculum indicate that current drug information courses address much of the didactic subject matter recommended by Troutman. Several topic areas (library orientation, study design and clinical importance) have no corresponding categories in the recommended curriculum. The manner in which statistical methods is addressed by the recommended curriculum seems to be different from the question asked in this study. As seen in Table III, 41 schools are spending an average of 3.3 hours teaching statistical methods; however, it was not clear from the responses if the statistical methods were a part of the drug literature evalu-

**Table V. Course topics not included**

Course topic	Percent	n
Drug Utilization Evaluation	30.8	16
Career Opportunities	30.2	16
Library Orientation	28.3	15

ation subject area. The topics Keeping Current with the Literature, Ethical and Legal Issues and Quality Assurance in Drug Information Services were not included as a part of this study's survey instrument(14).

## LIMITATIONS

Experiential drug information clerkships offered or required by schools and colleges of pharmacy were not evaluated as part of this study. Other limitations included an inability to analyze three questions regarding the number of students enrolled in each drug information class, the professional year in which the course was offered for each degree program and the number of laboratory hours associated with each topic. Despite repeated revision of these questions during the review process of the survey instrument, they were not answered consistently by all of the respondents in the national survey. Survey studies rely on the assumption that each respondent will view the questions and ranking choices the same as other respondents and as the investigator intended. The ranking choices for course topic emphasis were not defined in this survey and may have been interpreted differently by the respondents; however, the request for lecture hours devoted to each topic may have compensated for this.

## CONCLUSION

The results of this study are similar to those completed previously(3,6). Fifty-six (84.8 percent) of the respondents reported that they offered a separate drug information course at their institution and of these, only 29 (52.7 percent) offered the course to their BS students; 27 (67.5 percent) offered the course for their post BS students; and 25 (71.4 percent) offered a separate drug information course to their entry-level PharmD students.

The role of the pharmacist as a provider of information continues to expand. It is important that all pharmacy students be allowed the chance to receive adequate training in drug information so that they may react to the increasing demand for drug information by fellow health professionals and the public. It has been suggested that the skills required to provide in-depth drug information can only be acquired through required didactic and experiential drug information programs(6). These results suggest that many pharmacy students may not have the opportunity to gain this type of experience.

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