INSTRUCTIONAL DESIGN AND ASSESSMENT

An Elective Course in Women's Health

Leisa L. Marshall, PharmD, and Laurel E. Ashworth, PharmD

Mercer University College of Pharmacy and Health Sciences

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Objective. To design, implement, and assess a women's health elective course for second- and third-year doctor of pharmacy (PharmD) students.

Design. A women's health course was developed, focusing on health promotion, disease prevention, and treatment throughout a woman's lifespan. Course format included didactic lectures, in-class activities, peer teaching, case studies, and reading assignments.

Assessment. Student performance and learning were assessed based on class participation, (graded 3 times during the semester), activities and assignments, (graded weekly), and 2 formal written assessments. Student survey results indicated perceptions of women's health had changed in 3 ways: a realization that many diseases manifest differently in women than men, an increased awareness of numerous diseases not addressed in the required curriculum that affect women, and a greater appreciation of the physiological and pharmacokinetic differences that increase the potential for adverse drug reactions in women.

Conclusion. An elective course in women's health was well received by PharmD students. Excellent student performance in weekly active-learning activities and class participation, however, did not translate into excellent performance on subsequent formal assessments.

Keywords: women's health, active learning, peer teaching

INTRODUCTION

Women's health-related content and outcomes are a vital component of health professions' educational programs and are included as part of the patient-centered care and population-centered care required by the Center for the Advancement of Pharmaceutical Education (CAPE) Outcomes.¹ A women's health curricular resource for pharmacy, including a gender-related curriculum guide and suggested topics addressing women's health concerns across the lifespan, was made available to pharmacy educators in 2005.^{2,3}

As part of the American Association of Colleges of Pharmacy (AACP) and US Health and Human Services (US HHS) collaboration, a 2004 Web-based review of existing pharmacy curriculum devoted to women's health topics was conducted. Information posted on college and school home pages, course catalogs, schedules, and specific course postings were reviewed for inclusion of women's health topics. Approximately 40% of US colleges and schools of pharmacy specifically mentioned

women's health instruction in required, elective, and experiential course offerings.¹ Twenty-one didactic elective courses focusing on women's health issues were identified, but only 22 required courses specifically indicated coverage of women's health content. Given that a Web-based review was limited to posted materials and course descriptions, women's health issues may have been included in more required pharmacotherapy courses than indicated by the review.¹ Despite these resources, manuscripts describing women's health courses, contents of women's health issues in required and elective courses, and practice experiences in US colleges and schools of pharmacy are limited.^{4,5}

The specific curricular goals of this project were to develop, implement, and assess an elective course on women's health, covering selective topics in the AACP – US HHS curriculum guide. Course objectives, lecture, and discussion topics; types of active-learning activities; and placement in the existing curriculum are described. Assessments developed and employed are discussed, including course evaluations.

DESIGN

The curricular goals of this project were to develop, implement, and assess an elective course, Women's Health, covering selective topics in the AACP-USHHS

Corresponding Author: Leisa L. Marshall, PharmD, Clinical Professor, Mercer University College of Pharmacy and Health Sciences, 3001 Mercer University Drive, Atlanta, Georgia 30341. Tel: 678-547-6215. Fax: 678-547-6384. E-mail: Marshall_L@mercer.edu

curriculum guide. Therefore, the course was designed to include selective topics and learning objectives from the more than 100 included in the guide.^{2,3} Faculty members chose topics, learning objectives, and used resources from the guide based upon the goal of augmenting the required curriculum and curricular outcomes of the existing PharmD program. Faculty members reviewed course syllabi from required courses taught in the first, second, and third years of the college's PharmD program, and compared topics and objectives with the curriculum guide. Faculty members also reviewed publications about women's health courses or curriculum in other health care professional degree programs, namely nursing and medicine, when designing the course.⁶⁻¹¹ The focus on the implemented course was women's health across the life-span, and diseases unique to or with higher prevalence in women compared to men. The course met the curricular goals of developing and implementing an elective course in women's health covering selective topics in the AACP-US HHS curriculum guide. Selected topics and instructional techniques described in the medicine and nursing education literature were incorporated into this women's health elective course.⁶⁻¹¹ For example, cooperative cases focusing on female patients included prior required reading or Web-based tutorials, previously described by Zebrack⁹ and Wiess.¹⁰

Once the Women's Health course topics were chosen, quantitative and qualitative assessments were developed to evaluate student mastery of course competencies and to obtain student course evaluations. Assessments included measures of student performance on formal assessments, active-learning activities, and classroom participation, as well as a survey of student course evaluations.

Table 1 provides a comprehensive list of the topics chosen for inclusion in Women's Health and presented during the semester. The course began with an introduction to current issues in women's health policy, followed by lectures and in-class activities on health promotion and disease prevention in females from birth to the geriatric age. A majority of the course consisted of discussions on selected conditions unique to women, (eg, polycystic ovary syndrome, breast cancer), and conditions with different risk factors, presentation, or treatment in women and men, (eg, substance abuse, osteoporosis). Faculty members provided students with learning objectives that were specific to the lecture and discussion topics. Student competency was assessed through in-class active-learning activities, class participation, and 2 formal written assessments.

Women's Health was open to second- and third-year PharmD students. In the curriculum, elective courses are taught 1 day a week for the entire semester, but required

Table 1. Lecture and Discussion Topics for an Elective Course in Women's Health

Current Issues in Women's Health Policy and Research
Health Promotion and Disease Prevention in Women as:

Infants
Adolescents
Young Adults
Adulthood, including Perimenopausal and
Menopausal Years
Mature Adulthood
Geriatric Adults

Cultural diversity among US females:
implications for pharmacists

Medication adverse effects in women

Selected Conditions primarily affecting women
or with differing risk factors, presentation,
or treatment in women than men:

Fetal alcohol syndrome
Polycystic ovary syndrome

Endometriosis

Pelvic inflammatory disease

Infertility

Premenstrual dysphoric disorder

Substance abuse

Cardiovascular disease

Osteoporosis

Lung cancer

Colon cancer

Breast cancer

pharmacotherapy modules are taught using the block format schedule. While enrolled in this elective, second-year students completed 3 required cardiovascular/renal modules, and third-year students completed infectious disease, integument and special senses, and hematology/oncology modules.

The course format for Women's Health included lectures, in-class activities, peer teaching, case studies, reading assignments, and drug information presentations. One faculty member taught the majority of the course, with the assistance of another departmental faculty member for several guest lectures. The class met weekly for 2 hours. The first 50-minute session usually included a lecture and the second 50-minute session was used for in-class activities, which included cooperative case studies, short application activities, in-class writing assignments, student-generated questions, Web-based tutorials, self-assessments, and peer-teaching (Table 2). The topics and activities for the second 50-minute session were chosen by faculty members to complement the learning topics presented in the previous didactic portion. Peer teaching was an integral part of the second 50-minute session. Students led case and application activity discussions and made

Table 2. Active Learning Strategies Employed in a Women's Health Elective Course

Peer teaching
Individual and small group presentations by students
Discussions led by faculty and students
In-class written assignments
Web-based tutorials
Web-based self assessments
Student-generated questions
Cooperative cases
Application activities

selected topic and drug information presentations. The majority of course material, assignments, and readings were posted on Mercer University's Web-based course delivery system, WebCT, with additional in-class activities and assessments distributed in class. No textbook was required; instead, students had outside-of-class assigned readings and Web-based tutorials available through university library resources or through organization or federal Web sites. Students were directed to materials available at the National Institutes of Health, National Women's Health Information Center, US Department of Health and Human Services, US Food and Drug Administration (FDA) Office of Women's Health, National Women's Health Network, and Medscape Web sites, which contain information and research on a wide variety of women's health topics and concerns.¹²⁻¹⁷

EVALUATION AND ASSESSMENT

Student mastery of course content was assessed via performance on 2 formal written assessments, in-class participation, and active-learning activities. The 2 formal written assessments were short-answer and assessed mastery of specific course objectives from outside-of-class reading and assignments, didactic lectures, in-class activities, peer teaching, and case studies. These were administered during weeks 8 and 16 of the semester. Student performance on the formal written assessments (40% of course grade) was modest. The mean grade was 80.3 ± 9.4 .

Sixty percent of the course grade resulted from class participation and graded active-learning activities. Class participation was an integral component and included participation in all individual and group activities, and attentiveness to classmates and faculty members. Class participation was evaluated 3 separate times during the semester to allow for appropriate feedback and opportunities for improvement. The class participation rubric used is depicted in Table 3.

Faculty members also evaluated student performance on active-learning activities multiple times during the

Table 3. Class Participation Evaluation Rubric Used for a Women's Health Elective

< 70%	Disrespectful of peers or faculty, attendance problems, or rarely participates in classroom activities or discussion.
70%-80%	Respectful of peers and faculty; anticipates classroom activities and discussions, but rarely takes leadership role.
80%-90%	Encouraging and respectful to peers/faculty; takes a leadership role in some classroom activities and discussions.
90%-100%	Encouraging and respectful to peers/faculty; takes a leadership role in many classroom activities and discussion.

course, affording timely feedback. For example, cooperative cases which students completed and discussed in class were graded by course faculty members and returned the following week. A recently developed Active Learning Inventory tool ranking 22 active-learning activities as low complexity, moderate complexity, and high complexity was used.¹⁸ Active-learning activities from each complexity level were incorporated into Women's Health (Table 2), including cooperative cases (high complexity), small group presentations, discussions, and peer teaching (moderate complexity), and application activities and student-generated questions (low complexity).

Course faculty members developed and used evaluation tools to assess the 2 most comprehensive student active-learning activities: the student drug information assignment, and the small group presentation. Areas assessed included preparation, research, and delivery. Both the drug information assignment and student group presentation were designed to reinforce and augment skills and competencies from the first year of pharmacy school. Selected drug information topics are listed in Table 4. Students were asked to use current primary references and resources available through organization and federal Web sites to answer the drug information questions. Students presented their answers verbally to the class and submitted a 4- to 6-page written answer to course faculty members. Student performance on the graded active-learning activities and class participation was high, with a mean grade of 92 ± 1.8 by the end of the course.

A survey instrument was developed to evaluate the students' opinions of the seminar-style course and included 14 closed-ended items covering course content, delivery, and active-learning exercises. Students rated each item on a 5-point Likert scale. The instrument also included 2 open-ended items; the first asked students to express how their perception of women's health had

Table 4. Selected Drug Information Topics in a Women's Health Elective Course

Sjogren's syndrome – Describe the epidemiology, symptoms, and current therapy in US women.
Drug Induced Lupus – Describe the symptoms, medications commonly implicated and usual therapy in US women.
Complementary alternative medication use in US females– Identify and discuss differences among ethnic groups and give possible reasons for these differences.
Smoking and Lung Cancer – Identify and discuss reasons why women are more likely to develop lung cancer than men given the same level of exposure to tobacco smoke.
Smoking cessation – How do hormonal changes affect a woman's ability to quit smoking and what nicotine replacement products are most helpful for women?
Alcohol use among college students – Describe the trends in alcohol use, abuse, and related accidents among college-aged women versus men.

changed after completing the course, and the second solicited students' suggestions for pharmacist-provided services in a community pharmacy focusing on women's health. The survey instrument was approved by Mercer University's IRB. Students completed the anonymous survey voluntarily at the conclusion of the course. Pulse Survey II by Scantron (Eagan, Minnesota) was used for survey analysis.

Twenty-one students (100%) completed the voluntary, anonymous, course evaluation. Survey results are presented in Table 5. The 4 items receiving the highest percentage of strongly agree responses were: (1) the course objectives were clearly stated in the syllabus and faculty handouts (57.1%); (2) the methods of evaluating student performance in active-learning activities/class participation were clear (52.4%); (3) the lecture portion of the course met course and individual lecture objectives (47.6%); and (4) the amount of in-class opportunities resulting in a fair participation grade was sufficient (47.6%). One item asked the students to indicate if completing the drug information exercise reinforced drug information skills learned earlier in the curriculum. To this query concerning prior learning and skills, 33.3% responded strongly agree and 52.4% agree.

As part of the survey, students answered 2 open-ended items: (1) ways their perception of women's health had changed after completing the course, and (2) suggestions they had for pharmacist-provided services in a community pharmacy with a focus on women's health. The 3 most commonly listed ways in which students' perceptions of women's health had changed included: realization that many diseases manifest differently in women than men, awareness of numerous diseases primarily af-

fecting women but which are not addressed in required courses, and greater appreciation of the physiological and pharmacokinetic differences that increase the potential for adverse drug reactions in women. Table 6 lists students' suggestions for pharmacist-provided services in descending order of suggestion frequency. Sixteen of 21 students (76%) listed nutrition, diet, and weight management consultation; advice; and patient education as suggestions for needed services.

DISCUSSION

Pharmacy faculty members at other institutions currently not offering a didactic elective in women's health may be interested in the course content and assessment as described in this manuscript. The literature on this topic are dated and curriculum in some pharmacy schools may need augmentation in the area of women's health.¹ Students, 20 female and 1 male, responded favorably to the course. Approximately 70% of the student body in our PharmD program were female. This is similar to the most recent national statistics available from AACP, that 62% of all students enrolled in first-year programs in fall 2008 were female.¹⁹

Women's Health covered selective topics in the AACP-USHHS women's health curriculum guide. As an example, "Drug-related effects that specifically affect women and those that affect women and men differently" is included in the curriculum guide in section 1.^{2,3} One lecture topic developed and presented by course faculty members in this elective was adverse effects of medication in women (Table 1). The lecture highlighted the physiological and pharmacokinetic differences in women and men that may increase adverse effects of medication in women. Recent medication withdrawals, where the adverse event profile was higher or more severe in women, were discussed. Although some of these issues are covered in part in other required courses in the curriculum, a comprehensive intact lecture in a course on this topic was not previously included in the curriculum. The lecture augmented the required and advanced curricular outcomes of the college of identifying, preventing, and resolving the adverse effects of medications.

Student course evaluation results indicated that students were satisfied with the course topics, format, and activities. Of the 14 items on the survey instrument, however, the 1 item that received less than a 70% response when combining the responses "strongly agree" and "agree" was "graded class participation increased my preparation prior to class."

This project had several limitations. The modest mastery of course learning objectives, as measured through the 2 formal written assessments, is problematic. Student

Table 5. Students' Evaluation of Women's Health, Post-course Survey Results, (n = 21)^a

Survey Items	Strongly Agree, %	Agree, %	Neutral, %	Disagree, %	Strongly Disagree, %
The course objectives were clearly stated in the syllabus and faculty handouts.	57	38	5	0	0
The required readings provided useful information.	33	53	14	0	0
The use of Web CT for course material and announcements was preferable to a traditional course pack.	33	53	5	5	5
The course followed a logical sequence of topics.	38	48	10	5	0
The methods of evaluating student performance in active-learning activities/class participation were clear.	52	33	10	0	5
Lecture portion of the course met course and individual lecture objectives.	48	38	5	5	5
Student presentation portion of the course met course and individual presentation objectives.	38	43	14	0	5
Preparing and presenting the group student presentation was a good learning experience.	33	38	14	10	5
Completing the drug information (DI) exercise reinforced DI skills learned earlier in the curriculum.	33	52	5	10	0
Small group case evaluations, writing assignments, and discussions in class were useful learning experiences.	33	52	5	10	0
Web-based tutorials and self-assessments provided useful information to meet course objectives and were beneficial.	29	43	14	14	0
Graded class participation increased my preparation prior to class.	33	33	24	10	0
Amount of in-class opportunities for participation to result in fair class participation was sufficient.	48	38	14	0	0
I would recommend this course to other students.	43	29	19	5	5

Abbreviation: WebCT = Web-based Course Tool for posting course materials, communication

^aResponses based on a Likert scale on which 5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; 1 = strongly disagree

performance on weekly active-learning activities and class participation (mean = 92) did not translate into similar performance on the 2 formal assessments. This discrepancy could be the result of several factors. It could indicate a weakness in the course format to adequately engage and prepare the students to remember the material after weekly meetings, or it could indicate grade inflation by faculty members in the active-learning activities and class participation. The discrepancy could also be reflective of poor preparation by the students for the formal assessments, or student difficulty with short-answer examination items. The majority of examinations in the required pharmacotherapy modules at this institution are multiple-choice format. The modest mastery of course objectives requires further analysis, and may necessitate modifications in course format, delivery, or assessments. Several students indicated they were not fully prepared for the final formal written assessment, as they had focused their study efforts on preparing for a major pharmacotherapy module examination given the previous day. Also, the multiple measures of student performance on active-learning activities and class participation throughout the semester may

have increased scores, compared to the single measurement nature of the 2 formal written assessments.

Another limitation of this project was the lack of pre-course assessment of student knowledge. As the course was designed to augment the required curriculum, a pre-test, posttest design would have been preferable. Differences in baseline student knowledge based upon second or third year of the curriculum, as well as prior degrees or

Table 6. Student Suggestions for Pharmacist Provided Services for Women

Nutrition, diet, and weight management consultation
Blood pressure, blood glucose, and lipid screening, monitoring and counseling
Osteoporosis screening and prevention and treatment counseling
Immunizations
Counseling and education about perimenopause and menopause issues
Lactation consultation, education, and supplies
Counseling and education about contraception, fertility, pregnancy, prenatal care

areas of study, should be considered in an analysis of this sort. Most students in the class were in their second year, but a few were in the third year of the curriculum, and brought a broader base of knowledge to the course.

CONCLUSION

A women's health elective course provided an opportunity for student engagement and exposure to topics pertinent to women's health that were not covered in the required pharmacy curriculum, in-depth or at all. Unfortunately, excellent student performance in weekly active-learning activities and class participation did not translate to excellent performance on subsequent formal assessments.

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