

Oral Manifestations of Menopause: An Interprofessional Intervention for Dental Hygiene and Physician Assistant Students

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Abstract

Purpose: Interprofessional education (IPE) is a means of fostering integration and collaboration between health care professions. The purpose of this study was to evaluate the effect of an IPE educational module on dental hygiene (DH) and physician assistants (PA) students' knowledge of the oral manifestations of menopause and overall confidence in treating these conditions.

Methods: A convenience sample of DH and PA students was used for this mixed-method study. Quantitative data was collected with pre- and post-tests using a modified Readiness for Interprofessional Learning Survey (RIPLS) and a principle investigator (PI)-designed knowledge of menopause test, to determine the students' attitudes and learning levels. Students participated in a one-time workshop that included an educational presentation on the oral manifestations of menopause and a case study exercise using a pseudo-standardized patient. Students from both disciplines, worked in preselected groups to create a patient care plan addressing the oral manifestations of menopause. Qualitative data was collected from student comments.

Results: Study results indicate an increase in participants' knowledge of the oral manifestations of menopause ($p < 0.05$). Results also suggest improved attitudes toward interprofessional teamwork and collaboration ($p < 0.05$), positive professional identity ($p < 0.05$), roles and responsibilities ($p < 0.05$) for IPEC core competencies RR1, RR2, RR3, RR4, interprofessional communication ($p < 0.05$) for IPEC core competencies CC3, CC4, CC 6. Qualitative data from interprofessional care plan formulation and debriefing demonstrated facilitation of gained confidence in applying new skills related to the oral manifestations of menopause.

Conclusion: Patients experiencing menopause are susceptible to oral manifestations. Implementation of an IPE intervention demonstrated correlation between an IPE experience and participants' knowledge, attitudes and confidence. Preparing students to meet the needs of menopausal women may ultimately decrease oral discomfort and improve overall quality of life.

Keywords: interdisciplinary Collaboration, interprofessional education, oral health promotion, menopause, women's health

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Introduction

Research supports interprofessional education (IPE) as a means of fostering integration and collaboration between medical and dental health care providers.¹⁻⁴ The 2010 definition of IPE by the World Health Organization (WHO) states, "Interprofessional education occurs when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes."⁵ Although interest in IPE has varied over the years, there is an increasing body of evidence supporting the inclusion of dental hygienists (DH) in IPE.⁶⁻⁸ A

recent call to action by Vanderbilt, et al., describes the need for DH to be included in IPE, specifically in regards to dental hygiene and physician assisting education programs.⁹⁻¹¹

Since DHs and PAs are frequently the first providers of diagnostic and therapeutic services, IPE between these health care providers is particularly important especially as women from the "baby boomer" generation transition through menopause.¹²⁻¹⁴ Approximately 65 million women in the U.S.

experience oral conditions related to menopause, with 43% of these women reporting oral pain and discomfort as compared to 6% of premenopausal women.^{14,15} Oral manifestations associated with menopause vary from those that are painful, such as burning mouth syndrome (BMS), to those that are not, such as periodontal disease.¹⁶ The range of oral manifestations reported include xerostomia, viscous saliva, increased caries, altered or unpleasant taste, ulcerations, BMS, trigeminal nerve pain, periodontal disease, osteoporotic jaw, and loss of alveolar bone height.¹⁷⁻¹⁹ Although recommendations have been made for treating the more specific symptoms such as xerostomia, BMS, and periodontitis, there are no oral care guidelines for menopausal women.^{16,20} The few recommendations found in the literature generally advise regular dental examinations, professional oral prophylaxis, basic oral care instruction, fluoride use, and the maintenance of a balanced diet including adequate intake of vitamin D and calcium.^{17,21-23} With the average American woman experiencing menopause at age 51 and a life expectancy of 80 years, addressing the oral health conditions related to menopause plays a critical role in the overall quality of life for this life stage.²⁴

Teaching methodologies in health care training programs incorporating the use of actors trained to portray patients in a simulated clinical setting, (standardized patients or SP), and case studies allowing for new learning to be applied to real-life scenarios following completion of a related lecture or lab, (case-based learning or CBL), have been shown to improve students' confidence within a non-threatening environment.^{25,26} The use of SP and CBL has been shown to improve students' communication, interviewing, and clinical skills.^{25,27,28} Research indicates that CBL is commonly used in both DH and PA curricula.²⁹⁻³¹ Calhoun, et al., reported that the majority of accredited PA programs use SP as a teaching methodology.³² However, little evidence is found regarding use of SPs in DH education and when reported its use has been limited to tobacco dependence counseling training.^{26,33} There is a lack of research available regarding use of SPs and CBL in menopause/oral health education across the health care disciplines. The purpose of this study was to evaluate the effect of an IPE educational module on dental hygiene (DH) and physician assistants (PA) students' knowledge of the oral manifestations of menopause, interprofessional collaboration and overall confidence in treating these oral conditions.

Methods

A mixed-method pre- and post-test design evaluated the comparative relationship between DH and PA students related to an educational intervention. Subsequent to Eastern Washington University IRB approval, a convenience sample of DH students from Eastern Washington University ($N=63$)

and PA students from the University of Washington MEDEX Northwest PA program ($N=29$), were invited to participate in the study. Inclusion criteria were current enrollment in the DH or PA program and matriculation in the respective program to the point of having had clinical exposure to patients.

DH and PA students were invited to attend separate informational meetings regarding the study. Students who completed a consent form ($N=54$), were emailed a link to enroll in the study workshop session. The principle investigator (PI) reserved a classroom at the study site equipped with a dental chair and audio-visual equipment for the workshop. All printed forms, tests and supplies were provided to the participants by the PI.

A pseudo-SP was employed to promote student practice in IPE, risk assessment, patient assessment and counseling, and care planning with increased comfort.³³ For the purposes of this study, the pseudo-SP did not undergo the minimum of 10 hours of training required to be a true SP,³⁴ but instead completed a one-hour training session. Following the completion of a one-hour training session, the pseudo-SP used a written script specifying signs and symptoms, how to respond to various lines of questioning by providing responses with dialogue, believable patient history of the presenting problem, and other personal information that allowed the pseudo-SP to answer questions participants asked.³³

The three-hour workshop began with a demographic survey, menopause knowledge pretest, and a modified Readiness for Interprofessional Learning Survey (RIPLS)^{35,36} pretest. Upon completion of the baseline assessments, participants listened to a presentation regarding IPE followed by information on the oral manifestations of menopause. Participants were then randomly assigned to one of six heterogeneous interprofessional (IP) teams to create a patient care plan based on a given case study and pseudo-SP presentation. Participants were provided guidelines for management of the oral manifestations of menopause (Figure 1) and the IPE Assessment, Diagnosis, Planning, Implementation, Evaluation, and Documentation (A.D.P.I.E.D.) Process of Care Algorithm (Figure 2), both designed by the PI. All participants received the same educational slide presentation and case study. The same pseudo-SP was used throughout the workshop. Upon completion of the workshop, participants were given a menopause knowledge post-test, modified RIPLS posttest, and participated in a videotaped debriefing interview.

Case Study

The workshop utilized a single case study addressing xerostomia, periodontitis, and oral osteoporosis. The case study format and use of pseudo-SP encouraged participants to assess a multitude of factors, provide patient education and counseling, and develop a collaborative care plan as a team. Each IP team

Figure 1. Guidelines for Management of the Oral Manifestations of Menopause ^{16,17, 63-72}

Condition	Intervention
General	Brush 2-3x daily; Floss 1-2x daily Regular Dental Visits Chlorhexidine Rinse prn Nutrition: Limit Sodium, Caffeine, and Alcohol Habits: Tobacco Cessation, Stress Reduction
Periodontium	Hormone Therapy Corticosteroids for Desquamative Gingivitis
Oral Osteoporosis	Radiographic Evaluation and Monitoring: Bitewing, Periapical, Panoramic 1500-2000 mg Calcium Daily 800-1000I IU Vitamin D Daily Osteoporosis Screening *Note medications and therapies coincide with systemic treatment
Xerostomia and Caries	Sialometry Sipping Water Frequently Saliva Substitutes Sialogogues Sugar-Free/Xylitol Mints and/or Gum Xylitol Mints, Gums, Oral Patches Prescription 1.1% Sodium Fluoride Toothpaste Fluoride Varnish Application Hormone Therapy
Burning Mouth Syndrome	Multivitamin Zinc Hormone Therapy Clonazepam Systemic or Topical Antidepressants Capsaicin Alpha-Lipoic Acid Psychotherapy Behavioral Feedback
Trigeminal Neuralgia	Stress and Anxiety Reduction Short Appointments

recorded findings, diagnosis, and treatment on a patient care plan worksheet used to collect qualitative data. The case study content was based on information from the literature review and represented a complex menopausal patient scenario requiring expertise from both DH and PA professionals for assessment, appropriate intervention and best outcomes.

Instruments

Instruments used in the current study included a demographic survey, modified RIPLS survey menopause knowledge pre- and post-test, patient care plan worksheet, and videotaped debriefing session. The demographic survey provided descriptive statistics of the sample regarding age, gender, race, professional discipline, years of clinical experience, and prior experiences. A multiple-choice pre- and post-test evaluated for changes in knowledge regarding oral manifestations of menopause and the oral systemic health connection. The knowledge test subsections included women's health and IPE, menopause systemic manifestations, oral manifestations, and oral health management in menopause.

The modified RIPLS was employed as a pre- and post-test. The modified RIPLS, a valid and reliable tool for evaluating IPE, is a 19-item survey with four subscales, using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5).^{35,36,37} This tool evaluated the influence of the educational intervention on participant's attitudes and perceptions of IPE. (Figure 3) The modified RIPLS collected data regarding two IPEC competencies, RR and CC, the foci of this study. The RR domain focuses on using the knowledge of one's own roles and those of other professions to appropriately assess and address the health care needs of the patients and populations served and the CC domain focuses on communicating with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and the treatment of disease.²

A patient care plan worksheet was completed by each IP team using a IPE A.D.P.I.E.D. Process of Care Algorithm, synthesized by the PI from the Interprofessional Team Reasoning Framework (IPTRF) algorithm and A.D.P.I.E.D. process of care.^{38,39} The patient care plan worksheet assisted teams in their responsibilities of identifying oral problems through IP interaction, streamlined data entry, and provided qualitative data.⁴⁰

Data was also collected via video recording of the participant's debriefing. The PI transcribed the videos to analyze for themes, measure participants' confidence in IP patient care regarding oral

Figure 2. Interprofessional A.D.P.I.E.D. Process of Care Algorithm^{38,39}

1 What is the health care setting? <ul style="list-style-type: none"> • Hospital • Medical Office • Dental Office • Other 		Interprofessional A.D.P.I.E.D. Process of Care <ul style="list-style-type: none"> *Progress through each step 1-7, including team discussion and documentation *Collect data & identify specific oral-systemic associations derived from assessment data that impact the diagnosis *Determine how to perform interprofessional treatment planning, implementation, and evaluation of patient outcomes *Use the given algorithm as a guide 		
2 Who will lead the team? <ul style="list-style-type: none"> • Dental Provider • Medical 				
3 Assess	4 Diagnose	5 Plan	6 Implement	7 Evaluate
Collect Objective & Subjective Data <ol style="list-style-type: none"> 1. Medical & dental history 2. Nutrition 3. Risk assessment 4. Exams 	Identify the Problem <ol style="list-style-type: none"> 1. Statement of risk for a problem 2. Statement for actual problem *Etiology: Determine factors associated with patient's problem <p>*Symptoms: Determine manifestations of identified problem</p>	Select Interventions <ol style="list-style-type: none"> 1. Identify factors & impact on intervention *Personal Factors: gender, age, social background, profession *Environmental Factors: social norms, culture, politics 2. Identify impact of oral health condition on daily activities & participation in society 3. Identify barriers to facilitate patient outcomes <p>Identify goals using statements such as, "The goal is to..." or "Patient will..."</p>	Activate the Plan <ol style="list-style-type: none"> 1. Collaborative interventions: Activities carried out in collaboration with other health care providers 	Evaluate Patient Outcomes <ol style="list-style-type: none"> 1. Evaluate patient response or results to intervention 2. Write a patient outcome statement including how the patient: *Looks *Feels *Behaves <p>If needed, modify patient care plan to improve outcomes</p>
Team Discussion: *What oral manifestations is the patient presenting with? *What symptoms are only apparent to the patient	Team Discussion: *What is the patient's priority/chief concern?	Team Discussion: *Identify team priorities *Which team members can address the patient's concerns & priorities *Determine interventions to be provided by each team member	Team Discussion: *Which team members will communicate patient outcomes? *Finalize documents & management of patient care	Team Discussion: *Evaluate patient outcomes *Determine next steps in treatment if needed
DOCUMENT				

manifestations of menopause, likeliness to use knowledge gained from the current study in the future, and feelings about the use of pseudo-SP and CBL. Data was analyzed using SPSS® statistical software (version 23).

Results

The response data represents 69% (n=25) DH students and 31% (n=11) PA students. Sixty-nine percent of the study participants were from the DH program versus 31% of the participants from the PA, providing representative samples from

the two programs. The majority of participants were female, Caucasian, DH students with an average age of 21 to 24 years. The PA students ranged in age from 25 to 54 years. One hundred percent of the respondents reported having had some experience with IPE. (Table I)

Descriptive statistics and a paired t-test compared change in knowledge of menopause and its oral manifestations from pre- to post-test in the DH and PA participants. Both groups demonstrated increased knowledge (p<0.05). Table II

Figure 3. Modified Readiness for Interprofessional Learning Scale (RIPLS) Questionnaire^{36,37}

The purpose of this questionnaire is to examine the attitude of health care students toward interprofessional learning.

Circle one response for each statement		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1	Learning with other students will make me a more effective member of a health care team	5	4	3	2	1
2	Patients would ultimately benefit if health care students worked together	5	4	3	2	1
3	Shared learning with other health care students will increase my ability to understand clinical problems	5	4	3	2	1
4	Communication skills should be learned with other health care students	5	4	3	2	1
5	Team-working skills are vital for all health care students to learn	5	4	3	2	1
6	Shared learning will help me to understand my own professional limitations	5	4	3	2	1
7	Learning between healthcare students before licensure would improve working relationships after licensure	5	4	3	2	1
8	Shared learning will help me to think positively about other health care professionals	5	4	3	2	1
9	For small-group learning to work, students need to respect and trust each other	5	4	3	2	1
10	I don't want to waste my time learning with other health care students before licensure	5	4	3	2	1
11	It is no necessary for undergraduate/postgraduate health care students to learn together	5	4	3	2	1
12	Clinical problem solving can only be learned effectively with students from my own program	5	4	3	2	1
13	Shared learning with other health care professionals will help me to communicate better with patients and other professionals	5	4	3	2	1
14	I would welcome the opportunity to work on small group projects with other health care students	5	4	3	2	1
15	I would welcome the opportunity to share some generic lectures, tutorials, or workshops with other health care students	5	4	3	2	1
16	Shared learning and practice will help me clarify the nature of patient's problems	5	4	3	2	1
17	Shared learning before and after licensure will not help me become a better team member	5	4	3	2	1
18	I am not sure what my professional role will be/is	5	4	3	2	1
19	I have to acquire much more knowledge and skill than other students	5	4	3	2	1

The Wilcoxon signed-rank test analyzed pre- and posttest modified RIPLS scores to test the second hypothesis, "Can an IPE module on oral manifestations of menopause improve DH and PA student's attitudes and perceptions about IPE? Table III shows significant changes in perceptions of IPE were indicated in two of

the four RIPLS subscales, teamwork and collaboration ($p < 0.05$) and positive professional identity ($p < 0.05$). The participants demonstrated improved perceptions regarding IPEC domains, RR ($p < 0.05$ RR1, RR2, RR3, RR4) and CC ($p < 0.05$ CC3, CC4, CC6) as shown in Table IV.

Table I. Demographic Characteristics

Characteristic	DH (n=25)	PA (n=11)
Gender		
Female	100% (n=25)	45% (n=5)
Male		55% (n=6)
Age		
21-24	84% (n=21)	27% (n=3)
25-28	12% (n=3)	27% (n=3)
29-33	4% (n=1)	45% (n=5)
35-54		
Race		
Caucasian	80% (n=20)	100% (n=11)
Hispanic	16% (n=4)	
Asian American/ Pacific Islander	4% (n=1)	
Prior Clinical Experience		
Yes	20% (n=5)	91% (n=10)
No	80% (n=20)	9% (n=1)
Prior Menopause Experience		
Yes	16% (n=4)	9% (n=1)
No	84% (n=21)	91% (n=10)
Prior IPE Experience		
Yes	100% (n=25)	100% (n=11)
No		
Experience Treating Oral Conditions		
Yes	84% (n=21)	27% (n=3)
No	16% (n=4)	73% (n=8)

Table II. Descriptive Statistics for PI-Designed Menopause Knowledge pre/post-test

	n	M	SD	SEM	LL	UL	t	df	Sig. (2tailed)
DH**	25	-1.440	3.06	.611	-2.702	-0.178	-2.356	24	.027*
PA**	11	-3.182	2.04	.615	-4.553	-4.553	-5.172	10	.000*

Confidence interval 95%; LL=lower limit; UL=upper limit
* $p < .05$.

**Dental hygienist, physicians' assistant

Data from the IP care plan exercise and debriefing answered the question, "Can an IPE workshop utilizing a pseudo-SP and CBL facilitate gained confidence of participants in applying new skills related to the oral manifestations of menopause? To explore this hypothesis, participants worked in one of six teams to construct an IP care plan based on PI-designed guidelines for managing oral manifestations of menopause, a given case study, pseudo-SP interaction, and PI-designed IP A.D.P.I.E.D. Process of Care Algorithm. Correct responses included:

- *Oral Diagnoses:* xerostomia, oral osteoporosis, and periodontitis.
- *Risk Factors for oral manifestations:* menopause, nutrition, alcohol, smoking, caffeine, salt, stress, lack of sleep, infrequent dental/medical visits, and poor homecare.
- *Barriers to care:* low medical/dental IQ, finances, and environmental factors.

Table V indicates all teams were able to successfully create an IP care plan using the case study information, PI-designed guidelines for management of the oral manifestations of menopause, and PI-designed IP A.D.P.I.E.D. Process of Care Algorithm. Table VI shows coded debriefing data indicating gained confidence in treatment of the oral manifestations of menopause.

Discussion

Table III. Wilcoxon Signed-rank Test Modified RIPLS Subscales Pretest/Posttest Comparison

Subscale	Items	Possible Score	M	SD	M	SD	Z**	p
Teamwork and Collaboration	1-9	45	41.28	3.318	42.25	3.281	-2.428 ^b	.015*
Negative Professional Identity	10-12	15	13.00	1.724	13.14	1.823	-.721 ^b	.471
Positive Professional Identity	13-16	20	16.72	2.250	17.61	2.284	-2.802 ^b	.005*
Roles and Responsibilities	17-19	15	12.22	1.551	12.47	1.464	-.849 ^b	.396

**Z (^b Based on negative ranks)
Asymptotic Significance (2-tailed) *p* value
**p* < .05

This study explored the effects of an intervention consisting of a presentation and pseudo-SP case study on the oral manifestations of menopause. Results of the study suggest that the implementation of an IPE workshop for DH and PA students on oral manifestations of menopause imparts new knowledge, gives participants the opportunity to communicate in small groups and improve attitudes and perceptions toward IPE, and facilitates gained confidence of participants in applying new skills related to the oral manifestations of menopause.

This IPE university-based study provided an opportunity to bring attention to the oral manifestations associated with menopause and their relationship to overall health. The results demonstrate an increase in participants' knowledge of oral health for the menopausal patient after completing this one-time workshop. These findings are consistent with those of Christenson demonstrating the positive effects of a single learning intervention.⁴¹ Results of the current study are also supported by research demonstrating that both PA and dental students benefit from interactions in IPE.⁴²⁻⁴⁴

Prior to participating in this study, the majority of participants demonstrated lack of awareness in the oral health manifestations and oral health management during menopause, as measured by the menopause knowledge pre-test. These findings were surprising given 84% of DH (*n*=21) and 38% of PA (*n*=3) in the current study reported experience in treating oral conditions in general.

Previous research suggests lack of specific training in oral health inhibits PAs from providing oral care services.^{6,7,45-47} Research conducted by Murray and Fried indicates that DHs also need more training regarding the oral manifestations of menopause.⁴⁸ Therefore, it may be inferred that if PA are not trained to provide oral care services and DH are not trained to

recognize and manage the oral manifestations of menopause, they may omit discussions about the oral manifestations of menopause when providing patient care. Results from this study support previous research indicating that oral health providers, including DHs, possess greater potential for the detection, monitoring, and prevention of chronic conditions⁴⁹ which in turn supports the importance of integrating women's health content into the DH curriculum.

Communicating in small IP groups facilitated improved attitudes and perceptions toward IPE through learning about each other's roles and responsibilities. Utilizing the PI-designed IP A.D.P.I.E.D. Process of Care Algorithm and guidelines for management of oral manifestations of menopause, DH and PA students collaborated in teams to create a patient care plan and provide patient-centered care with a focus on assessing and treating oral manifestations of menopause.^{36,38} The modified RIPLS evaluated students' attitudes and perceptions regarding IPE.⁵⁰⁻⁵² Measured aspects of students' attitudes and perceptions toward IPE showed significant improvement in IP teamwork and collaboration and positive professional identity. Overall, there were no significant changes in negative professional identity or RR domains. However, item number 17 in the RR domain was shown to be statistically significant.

Wakely et al. had similar findings to this study, reporting significant changes in all subscales except RR.⁵³ The lack of significant change in negative professional identity and RR domains may be because initial scores were already high, or because this was a one-time study limited to a three-hour time allotment. Also, the study evaluated two IPEC competency domains, RR and CC. Pre- and post-test scores align with those of Christenson and demonstrate significant growth in CC and RR.⁴¹ This suggests implementation of IPE has the potential to

Table IV. Wilcoxon Signed-rank Test Modified RIPLS Questions Determining Changes in IPEC Core Competency Domains Roles and Responsibilities (RR) and Interprofessional Communication (CC)*

IPEC Domain	n	RIPLS Items	Possible Score	M	SD	M	SD	Z**	p
RR1	36	1,3,9, 13,18	25	22.36	2.016	23.03	1.890	-2.474 ^b	.013*
RR2	36	1,2,3, 6,9,10, 11,13, 15,19	50	44.06	3.601	45.31	3.454	-2.438 ^b	.015*
RR3	36	1,2,3, 8,10,11, 13, 14, 15	45	39.47	3.895	41.41	3.549	-3.572 ^b	.000*
RR4	36	1,2,3, 15,16	25	22.31	2.227	23.08	2.143	-2.602 ^b	.009*
CC3	36	2,3,5, 7,13,14	30	27.08	2.260	27.78	2.380	-2.336 ^b	.019*
CC4	36	7,9,10, 13,14	25	22.14	2.100	22.81	2.095	-2.737 ^b	.006*
CC6	36	7,14, 15,16	20	16.89	2.148	17.61	2.296	-2.427 ^b	.015*
CC7	36	1,4,5,6, 8,9, 12,18,19	45	39.36	3.053	40.06	3.338	-1.291 ^b	.197
CC8	36	1,2,13, 15	20	18.08	1.592	18.56	1.557	-1.928 ^b	.054

** Z (^b Based on negative ranks)

Asymptotic Significance (2-tailed) *p* value

**p* < .05

*LEGEND: RIPLS items used to assess IPEC Core Competencies for IPE: Roles and Responsibilities (RR) and IP Communication (CC)	
IPEC Domain 2 Roles and Responsibilities	RR: Use the knowledge of one's own role and those of other professions to appropriately assess and address the healthcare needs of the patient and populations served.
RR1	Communicate one's role and responsibilities clearly to patients, families, and other professionals.
RR2	Recognize one's limitations in skills, knowledge, and abilities.
RR3	Forge interdependent relationships with other professions to improve care and advance learning.
RR4	Use unique and complementary abilities of all members of the team to optimize patient care.
IPEC Domain 3 Interprofessional Communication	CC: Communicate with patients, families, communities, and other health professionals in a responsive and responsive manner that supports team approach to the maintenance of health and the treatment of disease.
CC 3	Express one's knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information and treatment and care decisions.
CC 4	Listen actively and encourage ideas and opinions of the team members.
CC 6	Use respectful language appropriate for a given difficult situation, crucial conversation or interprofessional conflict.
CC 7	Recognize how one's own uniqueness, including experience level, expertise, culture, power and hierarchy within the healthcare team contributes to effective communication.
CC 8	Communicate consistently the importance of team work in patient-centered and community-focused care.

Table V: Team Care Plan Descriptive Statistics

Care Plan Category	N	Possible score	Min	Max	M	SD
Oral Diagnoses	36	3	0	3	1.67	1.211
Risk Factors	36	10	3	7	4.67	1.633
Barriers	36	3	0	2	.83	.753

help students improve their communication skills with other disciplines. This is particularly important for DH educators, because the Commission on Dental Accreditation (CODA) standards for dental hygiene programs require competence in comprehensive collection of patient care data (Standard 2-13), interprofessional communication and collaboration (Standard 2-15), and problem solving strategies related to comprehensive patient care and management (Standard 2-23).⁵⁴

Use of a pseudo-SP and CBL promoted shared responsibility and the study participants gained confidence in the care of the menopausal patient thus further supporting Gibson-Howell's findings demonstrating that the application of students' knowledge increases learners' acquisition and retention of knowledge.⁵⁵ The current study also supports results similar to Feely's et al. research demonstrating the value of utilizing a pseudo-SP for communication training and health education promotion.⁵⁶ This study's results are further strengthened by research demonstrating that when students work collaboratively to solve a case study, they are required to develop skills needed in the real-world including critical thinking, problem-solving, prioritization, working with others, and appreciation of roles.^{56,58} Working on a case study can facilitate students' gained confidence in their knowledge of content, success in group work, and the ability to look at a problem from various viewpoints, process it, and use critical thinking to reach a solution.^{56,57} Collaboration with other disciplines encourages greater communication, improved access and overall quality of care.⁵⁹

A primary goal of the pseudo-SP CBL exercise was for DH and PA students to participate actively in developing a care plan. The IP groups were also encouraged to use a presentation outline containing the PI-designed oral care guidelines for menopause. No comprehensive guidelines for oral care during menopause existed prior to the implementation of the current study.¹⁶ Data from the study's care plans revealed that the participants were able to function as a team, even with minimal familiarity with each other. Results support small group, CBL using a pseudo-SP enhances knowledge acquisition as well as confidence in application of new skills supports previous research findings demonstrating that SP and CBL positively impacts students' confidence, understanding, communication, and clinical

skills.^{25,26,33} Use of pseudo-SP and CBL incorporating the PI-designed IP A.D.P.I.E.D. Process of Care Algorithm, triggered the required decision points in the care plan. Similar to previous research, the current study demonstrates the integration of oral

manifestations of menopause into the A.D.P.I.E.D. process of care.⁶⁰ Study results suggest that the IP A.D.P.I.E.D Process of Care Algorithm may be a useful tool for educators charged with developing IP experiences. Furthermore, incorporation of this tool in DH curricula may enhance IP skills and confidence needed as dental hygiene scope of practice expands to meet population needs.⁶¹

Although no IPE curricula currently exists between DH and PA programs, this study validates that improvements in IP communication and understanding of roles and responsibilities may enhance opportunities for collaborative practice.¹⁰ Debriefing data demonstrated that this workshop permeated some of the silos separating medicine and dentistry, providing hope that a new generation of practitioners will develop professional identities and categorizations that deconstruct traditional roles.

There were limitations to this study that should be noted. Data was collected from a one-time study of a small sample, thus limiting any broad generalizations. Due to the volunteer nature of the study and the IPE credit received for attending, participants may have been extrinsically motivated to participate in IPE. The effectiveness of the group work may also have been limited by student fatigue, a lack of knowledge regarding their respective examination standards and scope of practice as well as discomfort discussing certain women's health issues such as vaginal dryness. It should also be noted there was an unequal distribution of students representing the DH and PA professions in each team which may not have authentically represented the IP team dynamic in a real clinical setting. Team members also had varying levels of didactic and clinical experience.

Long-term studies are recommended to determine if the knowledge and skills gained from a one-time intervention regarding oral manifestations of menopause occurring as part of the education process, translates to incorporation into clinical practice. Future research is also recommended to identify evidence based oral care guidelines for menopause and to continue to evaluate the PI-designed, IP IPE A.D.P.I.E.D. Process of Care Algorithm. Future studies should include a larger more diverse group of students, and include other healthcare professions. It is also recommended that the variations in knowledge during the DH education process be evaluated to determine the ideal point for

introducing IPE in the curriculum.

Conclusions

Patients experiencing meno-pause are susceptible to oral manifestations. Implementation of an IPE intervention demonstrated a correlation between an IPE experience and participants' knowledge, attitudes and confidence. Utilization of a process of care algorithm and guidelines for management of the oral manifestations of menopause promoted IP collaboration and comprehensive oral care management for the menopausal patient. Preparing students to meet the needs of menopausal women may ultimately decrease oral discomfort and improve overall quality of life. Additional IPE experiences, allowing DH and other health care disciplines to learn about, from and with each other has the potential to improve knowledge, perceptions, and confidence in patient care.

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