

Implementation of the Wonders of Pharmacy to engage high school students in the pharmacy profession

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Abstract

Objective: To examine feedback from high school student attendees and presenters about their perceptions of the Wonders of Pharmacy (WoPh) event to steer for future implementation.

Methods: An innovative community engagement and leadership project was implemented in a first year required pharmacy course. The project involved student creation of interactive stations to be showcased at the WoPh event to demonstrate the role of pharmacists to high school students and their families. Two surveys were distributed via Qualtrics following the WoPh event: a 30-item survey to attendees and an 18-item survey to student presenters. Descriptive statistics were used to quantify and identify trends. Thematic analysis was used for open-ended questions.

Results: The WoPh event included a total of 108 attendees and 34 interactive stations facilitated by 130 student presenters. Attendee survey responses (20.3% response rate) indicated that while 85% felt they formed positive connections with pharmacy students, only 57% felt the same way with connections with pharmacists. Among presenters (34.6% response rate), 88% believed the event showcased various aspects of the pharmacy profession, but only 37% thought it was well organized and 33% found the networking opportunities valuable. Key themes from first-year student presenters included engagement and impact on high school students and the challenges and rewards of participation.

Conclusion: The WoPh event introduced high school students and their families to pharmacy careers, fostering positive connections and interest in pharmacy careers. First-year PharmD students found the integration of the WoPh event in their required pharmacy course provided valuable insight for high school students and their families. However, PharmD students found that the integration of WoPh event into the course curriculum was disorganized. Addressing gaps in event organization and networking opportunities could further enhance this impactful educational event in the future.

Keywords: career exploration, community engagement, high school outreach, pharmacy education, recruitment

Introduction

Enrollment in pharmacy programs is declining.¹ There is no single unified theory to explain this phenomenon, but some have suggested that the following factors may play a role: higher tuition rates relative to average wage stagnation,²⁻⁴ lack of interest of the pharmacy career,⁴⁻⁵ oversaturation of degree programs,⁴ and a lack of assistance or mentorship to pharmacy applicants.⁵ Whatever the reason, or combination thereof, steps must be considered to increase enrollment in pharmacy programs, lest we face a future shortage in the profession and the viability of pharmacy programs.

More recently, emphasis has been placed on engaging with high school students to increase their interest in the pharmacy profession. One such effort, pharmacy summer camps, has shown positive results in increasing high school students' awareness and enthusiasm for pharmacy careers by increasing exposure to the profession.⁶⁻⁷ Additionally, hands-on pharmacy experiences for high school students, such as working as a pharmacy technician at a community pharmacy, can help promote pharmacy diversity, inevitably attracting a more diverse applicant pool.⁸ Another possible avenue is outreach programs led by Doctor of Pharmacy (PharmD) students that have been shown to enhance high school students' knowledge and interest in pharmacy, demonstrating the value of peer-led initiatives.⁹⁻¹⁰ These programs evaluated high school students' perspectives on the impact of the programs, knowledge of the curriculum, interest of the pharmacy field, and intentions of a pharmacy career. Furthermore, these programs occurred over several days to weeks and involved collaboration from pharmacists, PharmD students, and academic faculty.

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The CRoME (Collaborative Research On MEducation use & family health) Lab, formerly at the University of Wisconsin-Madison (UW-Madison) and now at the University of Kentucky, incorporates an intergenerational model to connect high school students, undergraduate students, PharmD students, practicing pharmacists, and researchers, exposing students to pharmaceutical health sciences research at different stages of their academic career.¹¹ In an extension to the lab's mission, the (a?) CRoME Lab Principal Investigator (PI) developed an idea for a career-fair influenced event, the Wonders of Pharmacy (WoPh), to showcase the variety of career opportunities within the pharmacy profession for high school students in Wisconsin. The event sought to leverage the strengths of current efforts in exposing high school students to the pharmacist career path while utilizing community engagement principles to guide the incorporation of high school student families. High school students and their families from across Wisconsin were invited to participate in the event. The WoPh event was developed independently, and a required first-year PharmD course was used to pilot student pharmacists' involvement in the program.

The primary objective of this project was to pilot the WoPh event and record feedback from presenters and high school student attendees for use in steering future implementation.

Methods

Preparation (Implementation of the Innovations in Community Engagement and Leadership Project)

In their first year in the PharmD program at UW-Madison, students take a required course titled Social and Behavior Aspects of Pharmacy Practice (SBAPP). The course focuses on the following outcomes, based on the American Association of Colleges of Pharmacy (AACP) Curriculum Outcomes and Entrustable Professional Activities (COEPA) 2022: Communication, Leadership, Self-awareness, Professionalism, and Scientific Thinking.¹² A total of 90 first-year PharmD students took the course and participated in the project. During the Principles of Personnel Management in Pharmacy Practice unit, students completed a project-based learning activity titled the Innovations in Community Engagement and Leadership Project. Collaborative teams of 3-5 PharmD students were each tasked with developing an innovative and interactive station to educate high school students about diverse facets of the pharmacy field. The student teams were supported and mentored by teaching assistants (TAs), second and third-year PharmD students, and Doctor of Philosophy (PhD) students in the Health Services Research in Pharmacy program. The CRoME Lab also partnered with the School of Pharmacy administrative staff, who assisted with marketing, recruitment, and day-of-event logistics.

Recruitment

A comprehensive marketing and recruitment strategy was used to share the information with the targeted population, including distributing flyers in five high schools throughout

Wisconsin with a variety of demographic profiles and in the UW-Madison School of Pharmacy (SOP). Additionally, three presentations about the event were given at three high schools and there were social media posts to reach a broad audience. Flyers included QR codes for high schoolers and their families to easily scan and register for the event. CRoME Lab members and PharmD students engaged and invited members of their own communities, such as churches, community clubs and events, school organizations, neighborhoods, and workplaces. This comprehensive marketing and recruitment strategy aimed to recruit students of diverse socioeconomic, geographical, racial, ethnic, and cultural backgrounds. Recruitment occurred from January to February 2024. Pharmacists who volunteered to participate in the event were recruited through word of mouth and flyers distributed in the SOP.

Wonders of Pharmacy Event Overview

High school students and their families were invited to attend this event on March 2nd, 2024, scheduled on a Saturday to maximize attendance. The event's duration was five hours, from 11AM to 4PM and was hosted in the UW-Madison SOP building. The time commitment for the PharmD students during the event was five hours as well. Lunch was provided to all attendees and presenters. High school students and their families explored the stations in the afternoon.

Interactive Student-Led Stations

The WoPh event consisted of 34 interactive stations arranged across different classrooms throughout the second floor of the UW-Madison SOP building. The process of brainstorming and the creation of the interactive stations were embedded into the SBAPP course as part of the weekly assignment for five weeks. The TAs and the course instructor were provided with descriptions of each interactive station from each PharmD student team to avoid duplication. First-year PharmD students presented a mock showcase of their interactive stations during their SBAPP class. All the presentations received feedback from TAs and other PharmD students in the class to ensure an accurate representation of the pharmacy profession. Twenty-four of the stations were led by first-year PharmD student teams. Volunteers, comprised of second and third-year PharmD students and PhD students, added 10 more stations: five relating to their student organizations and five concerning their research labs. Additionally, nine pharmacists from different practice settings volunteered to participate in the event by providing oversight of the PharmD student-led interactive stations and engaging with attendees and their families. Stations showcased disease states, medication safety education, pharmacokinetics, pharmacodynamics, a pharmacist's role in different healthcare settings, compounding medication, and diverse pharmacy career pathways. Station names and descriptions can be found in Table 1.

Survey Instrument Development and Distribution

Following the inaugural WoPh event, two distinct unvalidated survey instruments were developed by the PI and CRoME Lab research team members and distributed via Qualtrics to receive feedback from attendees and presenters on the WoPh event. The links to the surveys were emailed immediately after the event, followed by three reminders. Survey data collection ended three weeks following the event. A post-assessment design was used for surveys to gather immediate feedback on participants' experiences following their engagement. Studying multiple groups was important for understanding the variability in responses based on different backgrounds and experiences. The first survey was a 30-item survey distributed by email to attendees of the event, including high school students, parents, and other family members. The survey consisted of 15 items related to the attendees' perspectives on the event and 15 demographic questions. Attendee feedback survey can be found in Supplemental Material 1. Simultaneously, an 18-item survey was distributed via email to presenters at the event, including first-year PharmD students enrolled in the SBAPP course, TAs of the course, second and third-year PharmD students, PhD students, and CRoME Lab facilitators. One survey item categorized the type of presenter, and 11 items asked about the presenter's perceptions of the event. There were six additional items specific to those enrolled in the course or serving as TAs that assessed perceptions of the Innovations in Community Engagement and Leadership project in the SBAPP course using a 5-point Likert scale and open-ended questions. For the perception survey questions, respondents were asked to indicate their level of agreement with statements about the WoPh event on a 5-point Likert scale (1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, and 5 = Strongly agree). For the five open-ended questions, respondents had the option to explain in more detail their perceptions and experiences of the event. The presenter feedback survey can be found in Supplemental Material 2.

Data Analysis

Data analysis occurred after the collection of survey responses. One of the authors (SN) analyzed both the attendees' and the presenters' survey responses. Demographic characteristics and quantitative responses from the perception questions were analyzed using descriptive statistics. One open-ended survey question in the presenter feedback survey, "What was your main takeaway from your participation in the Wonders of Pharmacy event?", underwent thematic analysis, a method for identifying, analyzing, interpreting, and identifying common themes, subthemes, ideas, and patterns of meaning that come up repeatedly within data.¹³ The other four open-ended questions (Q15-Q18) in the presenter feedback survey did not receive sufficient responses and, therefore, were not analyzed. The survey responses were imported into Dedoose, a qualitative analysis software program. Codes were created independently for

emergent themes. Using the preliminary codes, the codes for each response were explored. Two authors (QA, ZP) analyzed the responses and reached an agreement on a codebook. After the initial coding round, overarching parent codes were established to group current codes and develop themes from parent codes.

Results

Overall, the WoPh event hosted 108 attendees, 130 presenters (90 first-year PharmD students, 20 second and third-year PharmD students, five PhD students, plus other student volunteers, and 15 CRoME Lab members), and nine pharmacists.

Attendee Survey Results

The survey was sent to all 108 attendees, of whom 22 responded (response rate = 20.37%). Of the 22 attendees who responded to the feedback survey, only 17 completed the demographic questionnaire. Demographics of the attendee respondents can be found in Table 2.

Table 2. Attendee Demographics

Characteristic	n (Valid %)
Attendee Type	n=17
Parent	7 (41)
High School Student	10 (59)
Highest Level of Education among Parents	n=7
Some high school	1 (14)
Associate degree	1 (14)
Bachelor's degree	2 (29)
Master's degree (MS, MBA, MA, etc.)	2 (29)
Professional or doctoral degree (PharmD, MD, JD, PhD, etc.)	1 (14)
Year in School among High School Students	n=10
10 th Grade	3 (30)
11 th Grade	6 (60)
12 th Grade	1 (10)
Gender Identity	n=17
Female	13 (76)
Male	3 (18)
Nonbinary	1 (6)
Race & Ethnicity	n=17
White or Caucasian	11 (65)
Asian	5 (30)
Native Hawaiian or Pacific Islander	1 (5)
Unknown/Missing Data	n=5 (22)

Attendee perceptions of the WoPh event were overall positive, with at least 85% of those responding agreeing or strongly agreeing with several of the statements related to the organization and the educational value of learning about the

pharmacy profession. While most attendees agreed that they were able to form positive connections with pharmacy students (85%), fewer agreed that they were able to form positive connections with pharmacists (57%). Of the respondents, 63% agreed that the number of stations was appropriate for the duration of the event. Attendees' results from the full survey can be found in Table 3.

Table 3. Attendee Perceptions of Wonders of Pharmacy Event

Survey Item Statement	Mean Score (SD)	Number of respondents selecting agree or strongly agree/total number of respondents to the question, (%)
The event was well organized.	4.55 (0.91)	21/22 (95%)
I would recommend The Wonders of Pharmacy event to my peers.	4.41 (0.95)	19/22 (86%)
The event increased my awareness of the role of pharmacists in healthcare.	4.40 (0.96)	18/20 (90%)
I formed positive connections with pharmacy students.	4.24 (1.06)	18/21 (85%)
I formed positive connections with pharmacists.	3.62 (1.06)	12/21 (57%)
The event provided valuable networking opportunities.	3.95 (1.05)	15/21 (71%)
The event helped me understand the different career paths within pharmacy.	4.48 (1.00)	19/21 (90%)
The event encouraged participation in pharmacy research.	4.24 (0.91)	19/21 (90%)
The event encouraged me to consider pharmacy as a potential career path.	4.48 (1.30)	18/21 (85%)
The stations were appropriate for the learning level of a high school students.	3.95 (1.00)	16/21 (76%)
The event provided valuable insights into the field of pharmacy.	4.36 (0.99)	20/22 (90%)
The displays at the event were enjoyable.	4.45 (1.09)	20/22 (90%)

Survey Item Statement	Mean Score (SD)	Number of respondents selecting agree or strongly agree/total number of respondents to the question, (%)
The displays at the event were educational.	4.23 (1.11)	19/22 (86%)
The prizes added excitement to the event.	4.23 (1.32)	17/22 (77%)
I learned something new about pharmacy at the event.	4.45 (0.98)	20/22 (90%)
The event showcased advancements in the pharmacy field.	4.29 (1.04)	18/21 (85%)
The event showcased various aspects of pharmacy.	4.55 (0.74)	21/22 (95%)
The number of stations was appropriate for the duration of the event.	3.91 (1.32)	14/22 (63%)

Abbreviations: SD, standard deviation

Presenter Survey Results

The survey was sent to all 130 presenters, and 45 presenters completed it (response rate = 34.62%). Among these respondents, 78% (n = 35) were first-year PharmD students, 13% (n = 6) were CRoME Lab members and facilitators, 4% (n = 2) were TAs, and 4% (n = 2) were second or third-year PharmD students. Most presenters (88%) agreed that the event showcased various aspects of the pharmacy profession and provided valuable insights into the field. However, less than half of the respondents (37%) agreed that the event was well organized and that it provided valuable networking opportunities (33%). Presenter results from the full survey can be found in Table 4. Twenty-eight of the first-year PharmD presenters responded to survey questions regarding their experience with the Innovations in Community Engagement and Leadership project throughout the semester (response rate = 31.11%). Most presenter respondents agreed that the project provided opportunities to engage with high school students (89%) in the community and practice communication skills with their team members. Table 5 includes first-year PharmD students' perceptions from the full survey.

Table 4. Presenter Perceptions of Wonders of Pharmacy Event

Survey Item Statement	Mean Score (SD)	Number of respondents selecting agree or strongly agree/total number of respondents to the question, (%)
The event was well organized.	2.78 (1.27)	17/45 (37%)
The event provided valuable insights into the field of pharmacy.	4.27 (0.78)	40/45 (88%)
The event showcased advancements in the pharmacy field.	3.71 (0.94)	32/45 (71%)
The event showcased various aspects of pharmacy.	4.44 (0.81)	40/45 (88%)
I would recommend The Wonders of Pharmacy event to high school students or pharmacists.	4.07 (1.03)	34/45 (75%)
I would recommend presenting at The Wonders of Pharmacy event.	3.38 (1.33)	26/45 (57%)
The event provided valuable networking opportunities.	2.91 (1.27)	15/45 (33%)
The stations were appropriate for the learning level of a high school student.	4.25 (1.03)	37/45 (82%)

Abbreviations: SD, standard deviation

Presenter Survey Themes

Of the 45 presenters who responded to the survey, 29 responded to the question, "What was the main takeaway from your participation in the Wonders of Pharmacy event?". Two main themes emerged from these responses: (1) Challenges and Rewards of Participation, and (2) Engagement and Impact on High School Students. Table 6 provides a summary of themes, subthemes, and illustrative quotes from survey responses.

Subthemes for the first main theme, Challenges and Rewards of Participation, included: perceived lack of compensation, event organization and execution, and personal growth and learning opportunity. Presenters found the event to be challenging and demanding, particularly in terms of the time and effort required.

Table 5. First-year PharmD Student Perceptions of Innovations in Community Engagement and Leadership project

Survey Item Statement	Mean Score (SD)	Number of respondents selecting agree or strongly agree/total number of respondents to the question, (%)
The project allowed me to apply the concepts taught in lecture to working with my team.	3.21 (1.28)	13/28 (46%)
I had an appropriate amount of time during discussion to work with my team.	3.07 (1.31)	12/28 (42%)
The expectations for this project were communicated clearly.	2.43 (1.07)	8/28 (28%)
The assignments were connected to the final project.	2.57 (0.81)	9/28 (32%)
The workload of the project was manageable.	2.93 (1.28)	9/28 (32%)
I was satisfied with the outcome of the project.	3.50 (1.35)	17/28 (60%)
I would recommend continuing this project for future years.	3.18 (1.28)	12/28 (42%)
I felt confident about the overall process of the project throughout the semester, such as listing the supplies, mock showcase, marketing goals, and budgeting goals.	2.82 (1.57)	10/28 (35%)
The project allowed me to practice my leadership skills.	3.36 (1.36)	16/28 (57%)
The project provided the opportunity to become engaged with high school students within the community.	4.25 (1.48)	25/28 (89%)
The project allowed me to practice communication skills with my team members.	4.18 (1.50)	23/28 (82%)
The project allowed me to practice collaborating effectively with pharmacy colleagues.	3.61 (1.31)	17/28 (60%)
I enjoyed this project.	2.93 (1.21)	11/28 (39%)

Survey Item Statement	Mean Score (SD)	Number of respondents selecting agree or strongly agree/total number of respondents to the question, (%)
I believe this project effectively supplemented the concepts taught in lecture.	2.61 (1.10)	7/28 (25%)
The project milestones were communicated clearly.	2.46 (1.27)	9/28 (32%)
I felt supported by my TAs throughout the duration of this project.	3.64 (1.38)	18/28 (64%)

Abbreviations: SD, standard deviation; TA, teaching assistant

Many of the first-year PharmD students expressed feeling inadequately compensated, with some noting that the rewards, such as extra credit points, did not match the effort invested. Despite these challenges, numerous participants appreciated the opportunity for personal growth. They highlighted improvements in public speaking skills and gaining valuable presentation experience as significant benefits. Additionally, there were several suggestions for better organization and clearer instructions for future events to enhance the overall experience.

Subthemes for the second main theme, Engagement and Impact on High School Students, included: understanding of high school students' experience, student engagement and interaction, exposure to the pharmacy profession, community outreach importance, and impact on future career paths. Presenters found engaging high school students through community outreach efforts to be both important and impactful. This engagement had a positive effect on both presenters and high school students. Presenters emphasized how these interactions can inspire high school students to consider careers in pharmacy by providing exposure to the profession beyond conventional stereotypes. One presenter responded, "The event allowed high school students to gain a deeper understanding of the diverse roles within the pharmacy field". Moreover, the outreach activities were seen as influential in shaping the future career paths of high school students, fostering greater appreciation and understanding of the pharmacy profession among young learners.

Discussion

The main goal of this project was to pilot the WoPh event and collect feedback from high school student attendees and presenters to inform future implementation. Overall, we were able to meet the objectives of this project. Perceptions of the WoPh event were varied among both attendees and presenters, and the event increased awareness about the

pharmacy profession among attendees. Feedback from attendees and presenters will be used to improve future iterations of the WoPh event.

A previous study investigating the impact of a five-week Career Explorers Program (CEP) on high school students' perceptions regarding the pharmacy profession showed that over the course of the CEP program, attitudes and opinions among CEP students regarding various areas of pharmacist tasks, characteristics, and training evolved. Students' awareness of the field grew, and many of the participants' misconceptions about pharmacies and pharmacists were debunked.¹⁴ Similar to this, the WoPh event has benefits for high school students and their families, providing them with an opportunity to learn more about the pharmacy profession early on and gain more knowledge about the pharmacy field. Creating a venue for attendees to directly interact with individuals who work in the field of pharmacy provides an opportunity to address misconceptions about the profession and showcase the plethora of pharmacist career paths. Compared to summer camps,⁶⁻⁷ presentations,⁹ and career programs,^{8,10,14} the WoPh event encourages families to engage with the event as a unit. Along with personal interests and intrinsic motivation, families can influence the career-decision-making processes through traditions, values, career perceptions and expectations, career exposure through family occupation, and financial stability.¹⁵⁻¹⁶ Additionally, the WoPh event may be more accessible to attendees compared to the extended immersive experiences, allowing high school students and their families to experience and explore the pharmacy profession with a lower time commitment.

In addition to educating attendees about the pharmacy profession, the WoPh event provided a venue for high school students to engage with PharmD students, and this benefit was observed by both attendees and presenters. High school students were able to form positive connections with PharmD students, which could lead to future mentorship opportunities. The thematic analysis revealed that presenters enjoyed the engagement and interaction and felt they had an important role in sharing and promoting the pharmacy profession with youth. While attendees felt networking with PharmD students was excellent, the same was not true with current practicing pharmacists. This is likely due to the low number of pharmacist volunteers in attendance at the event. To heighten the experience for PharmD and high school students, future events should focus on the recruitment of more practicing pharmacists.

It is important to enhance the dissemination of factual knowledge and assist students in becoming active learners, rather than just recipients of it, in their learning in pharmacy education.¹⁷ Project-based learning (PBL) is an approach to education that promotes students' active engagement in knowledge construction by allowing them to complete worthwhile tasks and create tangible outcomes. PBL is widely

accepted as a substitute for instructor-led traditional teaching. PBL is acknowledged as a beneficial strategy that improves student learning in higher education. It is an effective method that gives students the opportunity to use a variety of resources, develop a variety of ideas and theories, and apply skills acquired through practical and significant learning processes.¹⁸ The project was implemented as a PBL method within a required first-year PharmD course and intended to provide students with a unique opportunity to develop and showcase their leadership skills in a real-world setting. The project and station presentation at the WoPh event allowed students to actively practice leadership, innovation, community engagement, service, and teamwork.

While the culmination of the project in the WoPh event was overall a success, several areas of improvement were identified for the project itself. Better organization and communication are necessary between teaching staff and first-year PharmD students to clarify expectations and connect assignments throughout the unit to the final project. Enhancing this aspect could make the process smoother and more efficient, potentially increasing the number of students who view the event as a valuable supplement to their schoolwork. By addressing areas of improvement, the WoPh event can continue to serve as a cornerstone for both pharmacy education and community outreach, ensuring that future pharmacy professionals are well-prepared to meet the needs of the communities they will serve.

The structure of the WoPh event also aligns with strategic plans outlined by both the UW-Madison SOP and AACCP, both affirming their commitment to foster an inclusive community and leverage diversity of thought, background, perspective, and experience to advance pharmacy education and improve health.¹⁹ Engaging high school students early introduces them to the profession at a formative stage, which can inspire a wider range of students to consider pharmacy as a career and can improve pharmacy program enrollments.

Recommendations for Implementation

The WoPh event was resource-intensive, and other programs considering implementation should consider engaging stakeholders early on. Administrative support is vital for effective project execution and advertisement, funding, and marketing strategies. Stakeholders' buy-in from staff, students, and other leadership personnel is essential for project success. Gaining leadership support to acquire resources and promote innovation is crucial for the WoPh program or similar initiatives. Inevitably, leadership endorsement can provide the necessary momentum and credibility for the program's success. Without support, implementation can be cumbersome and burdensome for all trying to make the program come to fruition. Additionally, securing funding from multiple sources like grants, sponsorship, and alumni donations may be warranted for long-term sustainability. Marketing to a specific population,

like high school students, requires effective strategies through appropriate channels and messaging.

Future implementation of WoPh should focus on addressing student feedback. This includes providing PharmD students with a detailed timeline or roadmap, giving PharmD students access to previous years' projects, and having the project contribute more towards the class grade to ensure adequate compensation for the students' effort.

Additionally, it is warranted to recruit more practicing pharmacists to participate in the initiative, as many high school students wanted more interactions with pharmacists. This can be accomplished by partnering with local and national pharmacy organizations and providing flexible involvement opportunities to accommodate various schedules.

Another recommendation might be to administer a pre-post type evaluation at the actual event to improve response rates.

Future directions

For expansion and dissemination of the WoPh initiative to other pharmacy programs, future research will focus on optimizing its integration, considering institution-specific variables, such as class size, course layout, and population aspects. Another potential avenue for research includes exploring alternative methods to tailor the display and showcase format for individual presentations at high schools, while maintaining an interactive and engaging atmosphere, as all attendees expressed their interest in customized presentations for their individual high schools.

Furthermore, future implementation can expand on longitudinal or experimental study efforts to evaluate the effectiveness of the WoPh event on recruitment efforts through high school students' career decision, pharmacy schools' applicant and enrollment metrics, or the practical use of the skills learned in the first year PharmD course in real-world settings. Longitudinal efforts could also create longitudinal networks between high schoolers and their families, undergraduate students, PharmD students, and pharmacists, leading to more sustainable outcomes.

Limitations

The WoPh showcase event hosted at UW-Madison SOP had limited geographical reach. The advertisement was mostly targeted at high school students located in Wisconsin and most attendees were from Wisconsin. Therefore, the attendee survey data may not be representative of the population from other regions of the United States. The attendee survey also only garnered a response rate of 20.37% (22 out of 108), so the data gathered may not be representative of the whole attendee population. Additionally, since all first-year PharmD presenters were from the same pharmacy school, the results may not be generalizable to other pharmacy schools. The Hawthorne effect (whereby individuals modify their behavior

in response to their awareness of being observed), could also have impacted attendee and presenter survey responses, as they might have altered their responses due to the awareness of the results being read by event coordinators.

Conclusion

The WoPh event successfully introduced youth to the pharmacy profession, giving high school students and their families insights into pharmacists' diverse healthcare roles. Interactive stations helped showcase the profession and allowed high school students to form positive connections with student pharmacists, encouraging many attendees to consider pharmacy careers.

Despite positive feedback, notable disparities in perceptions between attendees and presenters existed, particularly regarding organization and networking opportunities. Addressing these areas can improve the WoPh event's unique educational initiative and collaboration among students, professionals, and community members. The project offered first-year PharmD students the chance to engage with the community, allowing them to showcase what they have learned about the pharmacy profession and improve effective communication within a team. Feedback from attendees and presenters underscores the value and potential impact of initiatives such as the WoPh in promoting pharmacy career awareness and interest among high school students.

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Table 1. Station Descriptions

N	Station	Description
1	Dance is Medicine	This station will focus on the power of dance therapy in facilitating health and wellness. WoPh attendees will be invited to dance to a song and learn about how exercise, specifically dance, can improve our mental and physical health. Additionally, attendees will be invited to dance to songs of various types of music including Afrobeat, High Fitness, and more!
2	MedSMART: Adventures in PharmaCity	In this station, WoPh attendees will get to play scenarios of a serious game designed to convey information and teach skills about appropriate and responsible use of medications. This game focuses on teaching players about using opioid prescriptions safely
3	OutSMART Cancer	In this station, WoPh attendees will get to play scenarios in a game-based health intervention to educate youth on cancer prevention strategies.
4	Exploring Contraception	Hear about how pharmacists have an important role in prescribing and managing patients on birth control to learn about contraception, their efficacy, and safety. We know some people may find this topic to be uncomfortable, but we're here to engage in conversation and show you example products!
5	The Price Is Right Game	Guess the price of the medication before insurance and learn about medication pricing, ingredients, and role of insurance companies.
6	Sweet Rx' Retail Pharmacy Simulation	Pull a prescription from a deck of prescription orders and fill the prescription with Lemonheads, Jellybeans, Tic-tacs, chocolate, and or gum in the provided pill bottles according to the prescription order. Learn how to fill out pseudo prescriptions and read SIG codes.
7	So You Think You Can Be a Pharmacist? Trivia	Different colored Suckers candies will be randomly arranged with each color associated with a different question relating to pharmacy and pharmacy school. Pick a sucker to test your knowledge.
8	Medication Matchers	Learn and match classes of medications with disease states.
9	PharmD Detectives: Who Has Done it?	Guess if the inventions displayed were created by pharmacists. Learn about the role of pharmacists beyond dispensing medications.
10	Over the Counter Game	Answer questions about over the counter (OTC) products in a Jeopardy-like game board.
11	Pill Pursuit Bingo	Fill out the bingo board by visiting different stations, communicating with PharmD students and pharmacists, and engaging in various activities. PharmD students will assist by marking off their bingo boards once the station or activity is complete.
12	The Pharmacy Grand Prix Relay Race	Race to put on sterile pharmacy garb and count pseudo pills.
13	Dose Detectives Guessing Game	Learn and select the correct therapeutic doses of medications. Get eliminated if a toxic dose is selected.
14	Are You the Drug? Pharmacy Bachelorette	Learn and match drugs with patient disease states.
15	Rx-ceptional Compounding Simulation	Learn to compound medications by measuring candy ingredients and following instructions.

N	Station	Description
16	Pharmacy Phellows Trivia	Answer questions about the importance of pharmacists, 'place vs pill', and drug structures.
17	Med MythBusters	Guess whether a pharmacy statement is true or false
18	Compounding Crazyies	Learn how to compound your own hand sanitizer by measuring and combining ingredients provided.
19	Discover your Pharmacy Path	In this interactive game, WoPh attendees can move game pieces forward, backward, or the sides based on whether they prefer those aspects of the job or work environment of a pharmacy career. Ultimately, they would discover the field of pharmacy that aligns best with what they seek in a career, determined by their final position on the board.
20	Breath of Fresh Air	Learn how inhalers can be used to open the lungs in a demonstration and guess the names of either inhaler versus Pokémon.
21	The Gas Busters: Silencing the Symphon of Digestive Discomfort	Learn how simethicone works in the body through an experiment demonstration of blowing bubbles into two cups of soapy water with and without crushed simethicone.
22	Pill boxers	Sort medications into the weekly pillboxes according to the medication prescription using gloves, glasses, and or tweezers to simulate difficulties geriatric patients may face.
23	Tablet Titans	Given a randomized medication prescription order, interpret the script with the correct SIG abbreviations and select the correct bottle with the accurate dosage. Count the correct number of candy pseudo pills for the prescription that is being filled.
24	Pick your Poison	Pull out a Jenga block from the Jenga tower. The Jenga block will feature a pharmacy related question for WoPh attendees to answer. Avoid causing the tower to fall.
25	PlinkRx	Teams or individuals in a 1v1 format will compete to answer pharmacy related questions correctly. They must be the first to press the buzzer and provide the correct answer to earn an opportunity to play our Plinko game. In our Plinko game, the number of chips you receive is determined by the number of questions you answer correctly. This, in turn, decides the size of the vial that the WoPh attendees can fill with candy. The more points you accumulate, the larger the vial you will be able to fill with candy.
26	Candy Confusion	Learn about containers, pill bottles, medication safety, safe storage, the use of child safety caps, and the importance of never likening medication to candy through this interactive game where WoPh attendees are prompted to identify the container with medication.
27	Interactions have Consequences	There will be three patient cases associated with a specific medication for treating their respective disease. WoPh attendees will select which patient should be administered the drug. Two of the patients are concurrently taking medications that could lead to adverse drug interactions. A mentos will be dropped into a bottle of Coke to visually demonstrate the negative consequences of the drug-to-drug interactions.
28	Pharmacy Pipeline	Similar to the game Oregon Trail, WoPh attendees will select a medication and then embark on a journey to navigate the challenges and lengthy process of drug development.
29	Operation OTC Med Safety	Learn about a PharmD student committee through the showcase an OTC Medication Safety board display from the PharmD

N	Station	Description
		Student Org Fair and engage in a scavenger hunt worksheet that involves reading labels of OTC products.
30	Operation Immunization	Learn about how vaccines work in a presentation and demonstration.
31	Operation Heart	Learn about your pulse in this matching game and marshmallow activity.
32	Operation Substance Use Disorder	WoPh will answer questions about substance use statistics in a Jeopardy-like game and will decipher between candy and medication.
33	Operations PHP (Personal Health Partners)	WoPh attendees will create a healthy plate of food from different options presented. Learn about healthy eating habits and how pharmacists and pharmacies are actively involved in helping patients make these decisions.
34	The Life of Pharmacy Game	Similar to the commonly known game, "The Game of Life", WoPh attendees will spin the spinner to indicate how many steps each player can move. Different colored paths indicate academic, action, and career cards related to pharmacy. Players have the option of playing or passing cards. WoPh will learn about different pharmacy career paths, fields, careers, and activities that pharmacists are involved in.

Abbreviations: WoPH, Wonders of Pharmacy

Table 6. Qualitative Analysis of Presenter Takeaways from Wonders of Pharmacy Event

Theme	Subtheme	Illustrative Quotes
Engagement and Impact on High School Students	Understanding of High School Students' Experience	"High school students don't have much experience in pharmacy." -P1 Student "High school students need something engaging." -P1 Student "I guess that more younger students are interested in pharmacy than I had thought." -P1 Student
	Student Engagement and Interaction	"I really enjoyed talking with high school students and their parents." - CRoME lab facilitator "It was great to connect and explain pharmacy to high school students." -P1 Student "I loved interacting with high schoolers and parents, sharing my personal experiences and answering their general questions." -CRoME lab facilitator
	Exposure to the Pharmacy Profession	"My main takeaway was that high school students got some exposure to the profession outside of 'counting pills'." -P1 Student "The field of pharmacy encompasses more than what most people are aware of." -CRoME lab facilitator "It was great to connect and explain pharmacy to high school students." -P1 Student
	Community Outreach Importance	"Community outreach is important in helping people learn about pharmacy." -P1 Student "This is an event that could get high schoolers interested in pharmacy." -P1 Student
	Impact on Future Career Paths	"That as a student pharmacist we need to be excited about our profession and promote the profession to youth within our communities because getting them excited will help to advance the profession further." -P1 Student "I felt that it was a great opportunity to share our experiences with the younger generation to potentially aid in their career and future paths." - CRoME lab facilitator "It was a great opportunity to get high school students that are considering pharmacy a foot in the door and some more insight of what to expect!" -P1 Student
Challenges and Rewards of Participation	Event Organization and Execution	"Very cool to spread the love of pharmacy but should be better organized and clearer with instructions next time!" -P1 Student "The information, worth and organization prior to the event were poor." -P1 Student
	Perceived Lack of Compensation	"A ton of work for next to NONE reward/compensation." -P1 Student "We put in so much time and work for only 3 extra credit points." -P1 Student "It was fun, but honestly very exhausting." -P1 Student
	Personal Growth and Learning Opportunity	"For myself, I have never presented anything before. So, for me it was a low stakes opportunity to learn to be a little more comfortable speaking up." -P1 Student "Being able to do outreach again." -P1 Student "It was a great opportunity to get high school students that are considering pharmacy a foot in the door and some more insight of what to expect!" -P1 Student