RESEARCH

A Randomized Prospective Study on Outcomes of an Empathy Intervention among Second-year Student Pharmacists

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Objective. To determine the impact of a single, 3-day intervention on empathy levels as measured by the validated Jefferson Scale of Empathy-Health Profession Students version (JSE-HPS).
Methods. Forty second-year student pharmacists were recruited to participate in a non-blinded prospective study. Subjects were randomized to an intervention group (n=20) or control group (n=20) and completed the JSE-HPS at baseline, 7 days postintervention, and 90 days postintervention. The intervention group consisted of a 3-day simulation, each day including a designated activity with loss of dominant hand usage, vision, and speech.
Results. The 3-day simulation increased empathy levels in the intervention group compared to the control group 7 days postintervention ($p=0.035$). However, there were no effects on empathy levels 90 days postintervention ($p=0.38$).
Conclusion. Empathy scores increased but were not sustained in the long-term with a 3-day empathy intervention.
Keywords: empathy, empathy training, pharmacy students, pharmacy education

INTRODUCTION

Empathy helps develop successful relationships between health care providers and patients and improves clinical outcomes.[1-7] Previous research highlighted the effect of engaging empathetically with patients on improvements in patient satisfaction and adherence, and accuracy of diagnosis and prognosis.[8-16] The Accreditation Council for Pharmacy Education (ACPE) Standards recognize the importance of empathy in pharmacy education, emphasizing the value of cultural competence, health literacy, and health care disparity awareness.[17]

Evidence is mixed when measuring levels of empathy among health care professional students over time. Previous studies showed that empathy declined in health care professional students over time.[18-20] Manolakis and colleagues pointed out that developing empathy through pharmacy school education is difficult as the majority of student time is focused on the pharmaceutical treatment of diseases and not on the person with the disease.[13] However, other studies contradicted the results, showing decline in empathy. In a longitudinal study measuring empathy levels in medical students, Costa and colleagues found an increase in empathy levels upon entrance into medical school and before the preclinical stage, but no change in empathy levels at the beginning of students' clinical training.[21] Wilson and colleagues compared empathy levels of first-year and third-year students in nursing, pharmacy, and law and found an increase in empathy levels among students in nursing and pharmacy.[22] Although there is conflicting evidence on empathy levels, interventions to increase empathy have been developed to address the importance of empathy in the patient-provider relationship.

Several interventions (eg, a module on death and dying, role reversal exercises, simulations in the life of a patient, aging workshop, theatrical performances, and geriatric medication games) are successful in increasing empathy in student pharmacists.[22-27] However, only 2 studies analyzed whether improved empathy levels were sustained after a training session, and neither study showed long-term sustainment.[25,26] Prior health care student empathy studies also lacked control groups, negating the ability to make causal statements with respect to the intervention.[19-24, 26-27] The purpose of this study was to determine the immediate and sustained impact of a single, 3-day empathy intervention on empathy levels among students and to address the lack of a control group by using a randomized, non-blinded, quasi-controlled design.

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METHODS

During November to December 2011, 100 second-year student pharmacists were sent e-mail invitations to participate in the study. Students with preexisting medical conditions were asked not to participate, and students with any self-reported medical conditions were automatically excluded. Forty student pharmacists who volunteered and provided informed consent were then randomly assigned to either the intervention or control group.

Subjects in the control group attended class as usual and did not participate in any intervention activities. Participants in the intervention group underwent a 3-day simulation of designated activities with daily debriefings conducted by a faculty member. One activity was assigned each day. The 3 activities involved: (1) loss of dominant hand (participants were instructed to wrap their dominant hand with gauze and were not allowed to use that hand); (2) loss of vision (participants had to wear sleep masks) and (3) loss of speech (participants were only allowed communicate using a whiteboard and marker). These activities for the intervention group took place during regular class hours in January 2012. Upon the completion of each daily activity, students in the intervention group were instructed to meet in the lecture room where they were divided into 5 groups. Each group met in individual breakout rooms to hold discussions regarding the daily activity, which covered its purpose, their feelings about the activity, items they learned, key take-away points, and how the items would affect their practice as future health care providers. After 15 minutes, the faculty member called back all groups to engage in a large group discussion. Students were encouraged to share their small group findings and report any feelings of discomfort. At the end of each debriefing, students were reminded to not continue study participation if they could not tolerate the effects of the activities. At completion of the study, all study participants were entered in a raffle for 1 of 5 $50 gift cards.

The Jefferson Scale of Empathy-Health Profession Students version (JSE-HPS) was administered to the intervention and control groups at baseline, 7 days following the intervention (as posttest 1), and 90 days following the intervention (as posttest 2). The JSE-HPS is a validated tool designed to measure changes in empathy levels among health care professional students and takes about 10 minutes to complete. The JSE-HPS tool is psychometrically sound with appropriate validity, consistency, and test-retest reliability, and was previously validated using student pharmacists.[26-31] The examination consists of 20 Likert-type items on a 7-point scale (where 7=strongly agree and 1=strongly disagree) and targets perspective-taking, compassionate care, and the ability to relate to the patient. Final scores range from 20 to 140 with higher scores indicating higher empathy during patient-provider encounters.

Frequency and percentages were reported for categorical data such as gender and ethnicity while mean $\pm$ standard deviation were reported for age. A repeated measures design employing a generalized covariance structure approach (PROC MIXED) was used to compare the effect of the intervention on empathy levels. Time periods in the model corresponded to data collection, ie, at baseline, 1 week after the intervention (posttest 1), and 3 months after the intervention (posttest 2). For the PROC MIXED design, a series of models were run to determine the best covariance structure, and a compound symmetry structure was determined to have the best fit (lowest Aikaike information criterion). Post hoc analysis was performed with a Bonferroni adjustment to control for multiple comparisons. The level of significance (probability of a type 1 error) was set as 0.05. Statistical analyses were conducted using SAS for Windows 9.2 (SAS Institute, Cary, NC). The study received IRB approval from Touro University California College of Pharmacy.

RESULTS

Forty participants (100%) completed the study with no loss to follow up. No significant differences in demographics were found comparing the intervention and control group (Table 1). Baseline JSE-HPS scores were similar between the intervention and control group (113.1 (10) and 110.6 (9.4), respectively; $p=0.38$).

All participants completed JSE-HPS at baseline, posttest 1, and posttest 2 although 1 subject in the intervention group had incomplete data at posttest 1. This subject's score was thus considered "missing" at posttest 1 in the analyses but effectively handled by PROC MIXED. The overall model (which can be thought of visually as comparing the slopes of lines made from connecting empathy scores of the intervention and control groups over time) was found to be significant ($p=0.035$) (Table 2). This

Table 1. Student Pharmacist Demographics

	Intervention (n=20)	Control (n=20)	p value
Age, mean (SD)	25.4 (2.3)	26.3 (2.9)	0.284
Gender Female, n (%)	12 (60)	8 (40)	0.525
Race, n (%)			
White	3 (15)	8 (40)	0.155
Black	1 (5)	1 (5)	0.999
Hispanic Origin	1 (5)	0 (0)	0.999
Asian and Pacific Islander	15 (75)	9 (45)	0.105
Other	0 (0)	2 (10)	0.999

Table 2. Comparison of Empathy Scores on the Jefferson Scale of Empathy Health Profession Student Version (JSE-HPS), Baseline, 7 Days, and 90 Days After a 3-day Empathy Intervention

	Baseline		Posttest1[a]		Posttest2[b]	
	Mean Score (SD)	Range	Mean Score (SD)	Range	Mean Score (SD)	Range
Intervention (n=20)	113.3 (10.0)	99-135	117.4 (10.1)	100-138	115.3 (11.9)	93-136
Control (n=20)	110.6 (9.4)	93-129	108.9 (10.5)	90-135	112.2 (10.2)	96-132

[a] JSE-HPS administered 7 days after the intervention
[b] JSE-HPS administered 90 days after the intervention
Bonferroni adjusted $p=0.044, 0.548$, and 0.072 for baseline vs posttest 1, baseline vs posttest 2 and posttest 1 vs posttest 2, respectively

significant interaction between the fixed effects time and group (intervention or control) can be seen in Figure 1 and suggests an overall intervention effect on measured empathy scores at the time points observed. Post hoc analysis found a significant difference among baseline, posttest 1 intervention, and control group empathy scores ($p=0.044$). No significant differences were seen when comparing posttest 1 with posttest 2 or baseline and posttest 2 empathy scores in the follow-up examinations.

DISCUSSION

Participants randomized to a single, 3-day empathy intervention had a significant increase in empathy levels 7 days postintervention but not 90 days postintervention. These results suggest that improvements in empathy levels with a brief intervention may not have lasting effects.

Several prospective, observational studies with empathy interventions show short-term increases in empathy levels.[22-27] Interventions included a 40-minute theatrical performance,[27] a 5-week module on death and dying including 2 presentations and a viewing of the film *Wit*,[23] and a patient empathy modeling activity in which students role played as patients with diabetes for 7 days.[24] Despite differences in the empathy intervention delivery, these studies showed an increase in empathy levels immediately following the intervention. Long-term empathy levels were measured in only one study. In this study, Van Winkle and colleagues found that a 40-minute theatrical performance increased empathy levels immediately after the intervention. However, no significant differences

in empathy levels was seen at 7 or 28 days.[27] Our study showed a significant increase in empathy levels 7 days postintervention, but no significant differences at 90 days. The decline in empathy levels from baseline may occur between 7 and 28 days postintervention. Therefore, empathy interventions may need to be implemented at weekly or monthly intervals in the curriculum.

In longitudinal studies with no intervention, empathy levels decline over time or remain the same in health care profession students. Longitudinal studies prior to 2011 showed declines in empathy over time.[18-20] However, Costa and colleagues' 2013 longitudinal study of medical students found that empathy levels increased at the preclinical phase with no significant differences in empathy levels at the beginning of clinical training.[21] Our study is consistent with the most recent literature that empathy levels remain the same or do not decrease over time. It would be beneficial to analyze empathy levels in student pharmacists longitudinally in their training (ie, at the beginning of pharmacy school, before advanced pharmacy practice experiences (APPEs), and after APPEs).

There were several limitations to our study. First, this study occurred at a single institution, which limits the external validity and generalization of the findings. Secondly, due to the non-blinded nature of the study, the control group was aware and exposed to students in the intervention group. This exposure to the intervention group may have had an indirect effect on the control group's empathy scores. Although this study had a small sample size, using a randomized quasi-controlled design was novel. In addition, while a previous JSE-HPS study (estimated Cohen's d=0.21) suggests the sample size at hand was adequate to detect any clinically significant differences, future studies may benefit from larger sample sizes with reinforcement of empathy interventions at weekly or monthly intervals.[28,31] Future studies are also needed to determine factors that impact empathy levels among student pharmacists. Measuring monthly or quarterly empathy levels using the JSE-HPS would be necessary as it is validated in the literature. Assessments at multiple institutions in various settings (eg, classroom, APPEs involving interdisciplinary care teams) may be useful in documenting empathy trends over time.
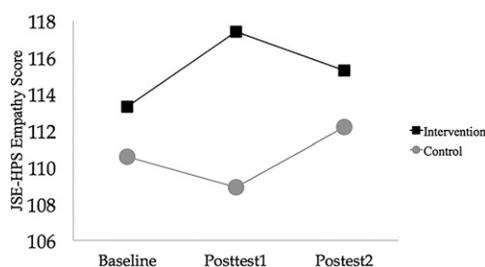

Figure 1. Comparison of empathy scores on the Jefferson Scale of Empathy Health Profession Student Version (JSE-HPS), baseline, 7 days and 90 days after a 3-day empathy intervention.

CONCLUSION

Developing empathy in student pharmacists is necessary to establishing strong patient-provider relationships. A single, 3-day empathy intervention had significant increases in empathy levels 7 days postintervention. However, these effects were not maintained long-term. Providing empathy training longitudinally may be necessary in the pharmacy school curriculum to increase and possibly maintain empathy levels.

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