

# Improving empathy in pharmacy learners through the use of a polypharmacy simulation exercise

Amie Taggart Blaszczyk, Pharm.D., BCGP, BCPS, FASCP, Rebecca J. Mahan, Pharm.D., BCGP, BCACP,
   
 Jamie McCarrell, Pharm.D., BCPS, BCGP, Rebecca B. Sleeper, Pharm.D., FCCP, FASCP, BCPS
   
 Texas Tech University Health Sciences Center School of Pharmacy, Department of Pharmacy Practice
   
 Abilene, Amarillo, Dallas, & Lubbock, TX

## Background

- Empathy is a core element of improving patient outcomes.<sup>1</sup>
- Empathy is difficult to assess formally, yet is a component of the “soft skill” requirement of ACPE’s Standard 3.<sup>2,3</sup>
- Empathy is enhanced by shared experiences.<sup>4</sup>
- With the aging of America, and the older adult’s dependence on complex medication regimens for the care of chronic conditions, a discordance in age and health-status of the health professional and patient could contribute to a lack of empathy for those struggling with managing these regimens.<sup>5</sup>

## How old are your learners?

## Specific Aim

*To determine the effectiveness of a “jellybean polypharmacy” simulation to inculcate student empathy for those managing multi-drug, multi-dose medication regimens.*

## What is the “Jellybean Polypharmacy” simulation?

- 8 different “prescriptions” given to each student
- Each “prescription” was a different dosing regimen and a different flavor jellybean
  - Total of 19 “doses” per day
  - Integrated medications with specific instructions to correct dosing
  - Regimen presented a drug interaction that the student had to work around
- Students managed the regimen for 1 week

## Acknowledgements

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## Methods

- All 3<sup>rd</sup> professional year SOP students enrolled in PHAR 4165: Special Populations 2015 - 2017 participated
- This activity was considered IRB Educational Exempt
- Data collected
  - Utilized the Kiersma-Chen Empathy Scale (KCES) to assess empathy using a Likert scale (pre- and post-exercise)
  - Students ranked perceived (pre-) and actual (post-) difficulty of managing the regimen
  - Utilized several open-ended questions at the end of the exercise to assess difficulty with regimen, quality of life impact and empathy
  - Age, gender and class year were collected
- Pre and post values of the 15 items from the Kiersma-Chen Empathy Scale (KCES) were explored.
  - Items 4, 9, 11, and 15 were reverse scored.
  - Total valid cases, median, and 25<sup>th</sup> and 75<sup>th</sup> percentiles were calculated for each item
  - Wilcoxon signed-rank test used to compare pre and post responses.
- Post-hoc analysis performed of perceived difficulty of managing the regimen in relation to growth in empathy (as measured by KCES)
- Qualitative analysis was performed on open-ended responses with regard to adherence, empathy & quality of life impact
  - 4 investigators characterized responses independent of one another
  - For responses where there was discordance, consensus was attained by discussion

**The Kiersma-Chen Empathy Scale**

The following questions pertain to your attitudes and beliefs toward diverse and disabled people. Please mark the number on the scale below that indicated your level of agreement or disagreement with each statement, where 1=strongly disagree, 2=somewhat disagree, 3=neutral, 4=somewhat agree, 5=agree, and 7=strongly agree.

	Strongly Disagree 1	Somewhat Disagree 2	Neutral 3	Somewhat Agree 4	Agree 5	Strongly Agree 7
1. It is necessary for a healthcare practitioner to be able to comprehend someone else's experiences.	○	○	○	○	○	○
2. I am able to express my understanding of someone's feelings.	○	○	○	○	○	○
3. I am able to comprehend someone else's experiences.	○	○	○	○	○	○
4. I will not allow myself to be influenced by someone's feelings when determining the best treatment.	○	○	○	○	○	○
5. It is necessary for a healthcare practitioner to be able to express an understanding of someone's feelings.	○	○	○	○	○	○
6. It is necessary for a healthcare practitioner to be able to value someone else's point of view.	○	○	○	○	○	○
7. I believe that caring is essential to building a strong relationship with patients.	○	○	○	○	○	○
8. I am able to view the world from another person's perspective.	○	○	○	○	○	○
9. Considering someone's feelings is not necessary to provide patient-centered care.	○	○	○	○	○	○
10. I am able to value someone else's point of view.	○	○	○	○	○	○
11. I have difficulty identifying with someone else's feelings.	○	○	○	○	○	○
12. To build a strong relationship with patients, it is essential for a healthcare practitioner to be caring.	○	○	○	○	○	○
13. It is necessary for a healthcare practitioner to be able to identify with someone else's feelings.	○	○	○	○	○	○
14. It is necessary for a healthcare practitioner to be able to view the world from another person's perspective.	○	○	○	○	○	○
15. A healthcare practitioner should not be influenced by someone's feelings when determining the best treatment.	○	○	○	○	○	○

## Open-ended questions

- Were there any “medicines” you opted not to take? Why? If a patient were to tell you this same reason was their reason for not taking that type of medication (i.e. antibiotic, osteoporosis medication, blood pressure medication), how would you relate/respond?
- What did you find was the hardest thing about managing your regimen? What was the easiest thing?
- How did this regimen impact your quality of life?
- Overall, did you see value in this exercise when it comes to understanding or interacting with patients with multi-drug, multi-daily dosing medication regimens? Why or why not?
- Do you see yourself utilizing what you’ve learned from this exercise in your career, either here at the SOP or as a pharmacist? How so?

<b>Orange Jellybean Contin</b>	Take 1 orange jellybean by mouth every 12 hours
<b>Green Jellybean-nitrate</b>	Take 1 green jellybean by mouth three times a day at 8AM, 12Noon and 4PM (**Do not take later than 4PM to ensure a green jellybean-free interval**)
<b>Yellow Jellybean-zinc</b>	Take 1 yellow jellybean by mouth every 8 hours
<b>Purple Jellybean-dronate</b>	Take 1 purple jellybean by mouth each morning 30 minutes before eating, with a full 8-ounce glass of water. Do not lie down for 30 minutes after taking this jellybean.
<b>Black Jellybean-alexin</b>	Take 1 black jellybean by mouth every 6 hours until gone.
<b>Brown Jellybean-astatin</b>	Take 1 brown jellybean by mouth at bedtime. (**Separate administration from orange jellybean by at least 2 hours**)
<b>Red Jellybean-alol</b>	Take 1 red jellybean by mouth twice daily
<b>White Jellybean-azole</b>	Take 1 white jellybean by mouth 15 minutes before each meal

## Quantitative Analysis

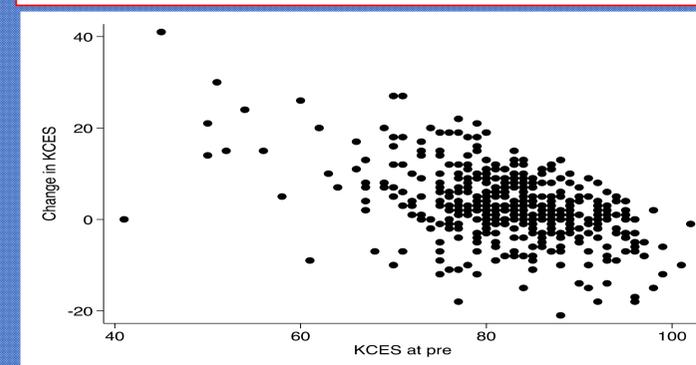
- The majority of the participants (51.3%) fell in the 23-25 years of age category, and 59.2% were females.
- No statistically significant differences in gender, age or KCES scores were found between participant groups based on year of data collection and no statistically significant differences were found in KCES from pre- to post-intervention when participants were compared either by gender or age.
- Overall, participants significantly improved ( $p < 0.001$ ) in empathy scores from pre- to post-intervention (mean [SD]: 82.3 [8.7] and 85.03 [8.4], respectively).
  - The effect size of such improvement was small (Cohen’s  $d = 0.36$ ).
- Individual analysis of the items showed statistically significant differences in all of them with the exception of items 7, 9 and 11. (**Table**)
- Difficulty of the regimen was perceived significantly more difficult after the simulation ( $p < 0.001$ ).
- Changes in KCES were negatively correlated with empathy score at enrollment ( $\rho = -0.43$ ,  $p < 0.01$ ) (**Figure**).
- Changes in anticipated difficulty of the regimen were highly inversely correlated to their values at enrollment ( $\rho = -0.70$ ,  $p < 0.001$ ).

Table Differences in Pre- and post-intervention empathy scores and difficulty of the regimen

	Pre	Post	diff (95% CI)	p
Q1	6.1 (1.2)	6.5 (0.9)	-0.42 (-0.57, -0.28)	<0.001
Q2	5.5 (1.1)	5.8 (0.9)	-0.34 (-0.48, -0.20)	<0.001
Q3	5.4 (1)	5.8 (0.9)	-0.32 (-0.45, -0.19)	<0.001
Q4 <sup>R</sup>	2.6 (1.4)	3.2 (1.5)	-0.55 (-0.75, -0.35)	<0.001
Q5	6.1 (0.9)	6.3 (0.9)	-0.21 (-0.33, -0.09)	<0.001
Q6	6.3 (0.9)	6.4 (0.8)	-0.12 (-0.23, -0.01)	0.009
Q7	6.5 (0.8)	6.6 (0.7)	-0.05 (-0.15, 0.05)	0.277
Q8	5.3 (1)	5.6 (0.9)	-0.31 (-0.43, -0.18)	<0.001
Q9 <sup>R</sup>	5 (1.3)	5 (1.3)	-0.02 (-0.20, 0.15)	0.831
Q10	5.9 (0.8)	6 (0.7)	-0.18 (-0.28, -0.07)	<0.001
Q11 <sup>R</sup>	4.1 (1.3)	4.2 (1.3)	-0.11 (-0.29, 0.06)	0.169
Q12	6.3 (0.9)	6.4 (0.8)	-0.15 (-0.26, -0.04)	0.001
Q13	5.9 (0.9)	6.2 (0.8)	-0.26 (-0.38, -0.14)	<0.001
Q14	5.8 (1)	6.1 (0.9)	-0.26 (-0.38, -0.13)	<0.001
Q15 <sup>R</sup>	3.1 (1.6)	3.5 (1.7)	-0.46 (-0.68, -0.24)	<0.001
KCES score	82.3 (8.7)	85 (8.4)	-2.69 (-3.85, -1.54)	<0.001
Difficulty	2.9 (1.3)	1.7 (1)	1.17 (1.02, 1.32)	<0.001

<sup>R</sup> Values were calculated using Fisher's Exact Test. <sup>R</sup> Reverse items. <sup>†</sup> Lower values reflect higher difficulty on a 7-point Likert scale.

Figure. Association of change in empathy score (Kiersma-Chen Empathy Scale, KCES) with empathy at enrollment.



## Qualitative Analysis

	2015	2016	2017	Selected Interesting Responses
The number of students with clear empathy noted within their response	43	42	50	<p>“Also, it was kind of depressing to be on all these medications and seeing all these bottles was just a constant reminder that health wise I was not ok. I can see how patient’s would be affected psychologically as well.”</p> <p>“If a patient told me they weren’t taking a particular medication, I would ask why. Depending on the answer, I would suggest an alternate medication, counsel them on the risks, or tell them to have a nice day.”</p> <p>“...If a patient told me they weren’t taking this type of medicine, I could understand why, and I would try to work with the patient and the patient’s health care provider to create a plan, so that the patient is optimizing medication use without compromising the patient’s medication regimen.”</p> <p>“The black licorice jelly belly had a very unpleasant taste which led me to only “pretend” to take them. If a patient were to tell me they weren’t taking a particular medication because it tasted bad, I would most likely tell them to ‘suck it up.’ It did serve the purpose of allowing us to kind of step into their shoes and shows the importance of relating to them exactly how important it is that they take all meds regardless of small issues such as taste.”</p>
The number of students who admit to a negative impact on their quality of life.	112	123	105	<p>“...embarrassing carrying all the bottles in public.”</p> <p>“I wish that I could tailor the regimen to my lifestyle instead of tailoring my lifestyle around my medications.”</p> <p>“The regimen just made me more anxious that I was always forgetting something.”</p>
The number of students admitting non-adherence (either intentional or unintentional)	143	67	73	<p>“I did not take the bisphosphonate-like bean. It was too complicated.”</p> <p>“...messed with my morning routine.”</p> <p>“It really does interfere with many things.”</p>

## Conclusions & Future Directions

- The Jellybean Polypharmacy Simulation Exercise (JPSE) increased empathy both objectively and subjectively in 3<sup>rd</sup> year pharmacy students, making it a potential activity to address the “soft skills” required of ACPE Standards 3 and 4.
- Students who perceived the regimen as “easy” before the exercise had larger improvements on the Kiersma-Chen Empathy Scale.
- The JPSE was a sufficiently difficult polypharmacy regimen for students to manage, and the majority of students endorsed a negative impact on their quality of life.
- Paternalistic comment themes require further investigation.
- The JPSE has interdisciplinary potential, and may be integrated as an IPE activity in the future.

## References

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