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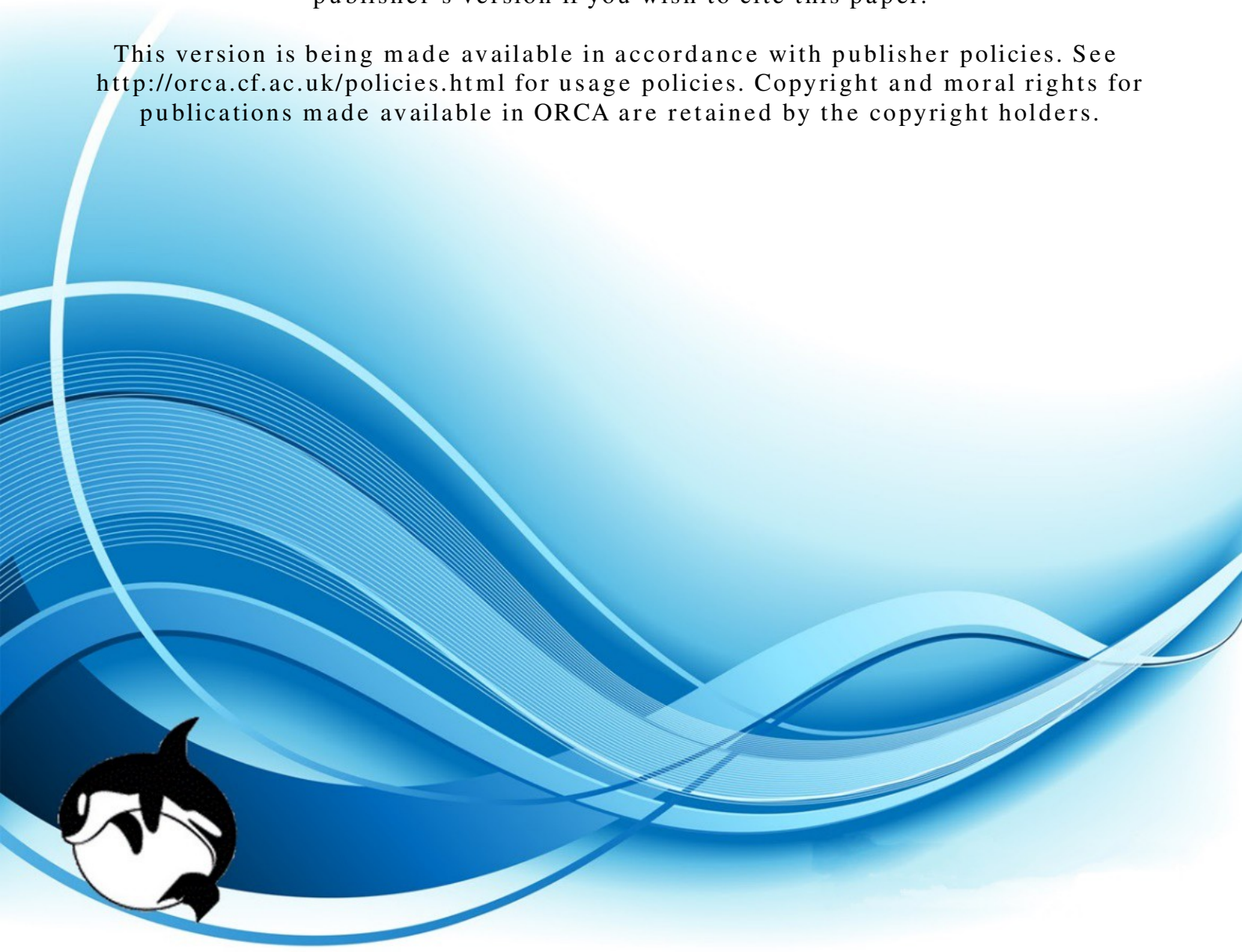

TITLE

Pharmacy students' reflections on a 'mock medicines' activity: Exploring intentional and unintentional non-adherence.

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Keywords

Patient perspectives, intentional non-adherence, unintentional non-adherence, mock medicines, pharmacy undergraduate education

ABSTRACT

Objective. To engage pharmacy students in a 'mock medicines' teaching activity to increase their understanding of the patients' perspectives of medicine-taking. To explore students' awareness of intentional reasons for non-adherence.

Methods. Students were given one of five different dosing regimes and asked to take the mock medicine (TicTacs©) over a one-week period. They completed a data capture form to log each dose taken or missed and provide reasons for this. An adherence score was calculated and all feedback transcribed for further analysis.

Results. Seventy-six out of 115 students submitted forms, where adherence ranged from 4 to 100% (mean 88.7, SD=19.77). Nine factors relating to unintentional non-adherence were identified compared to only one for intentional non-adherence.

Conclusions. Students engaged well with this activity showing a high percentage adherence but this was not related to the complexity of dosing schedule. Students demonstrated more awareness of the unintentional reasons for non-adherence than intentional.

INTRODUCTION

Understanding patients' perspectives of medicine-taking is crucial in tackling non-adherence. Non-adherence can be categorised into two different types: unintentional and intentional non-adherence.[1] Unintentional non-adherence is when medicine taking behaviour is affected by barriers that tend to be outside the control of the patient, for example, language barriers, inability to understand information, physical inability to access or swallow the medication, or forgetfulness.[2] In contrast to this, intentional non-adherence is a deliberate or conscious decision by the patient not to take the medication as directed (e.g. by altering the number of tablets taken), not taking it at all or stopping treatment early.[3,1] Nonetheless, patients may often explain these 'intentional' reasons as simply forgetting and therefore some overlap clearly exists between the two categories.

Pharmacists are in a good position to make a positive impact on adherence due to the close nature of the relationship with patients and the opportunities for one to one consultations, enabling them to explore the reasons for non-adherence and explain some of the potential consequences.[4,5] Understanding patient perspectives is a complex professional capability; it has been proposed that the notion should be instilled into pharmacists early on in their education and continually developed throughout their career.[6]

Finding the right methods for teaching pharmacy practitioners about patient perspective is often challenging. Skills for ensuring a patient-centred consultation are needed such as effective communication, as well as the ability to show empathy and compassion. Awareness of the different types of non-adherence is also central to identifying the right solution to address these problems.

The use of simulated patients when teaching consultation skills to pharmacy students was found to improve the students' perceived confidence and competence to conduct an effective consultation with patients in order to identify and resolve drug-related problems.[7] Empathy is also considered to be an important communication skill involving the ability to understand

patients' experiences and respond in a way that reflects that understanding.[8] The patient is an effective teacher when it comes to teaching communication and empathy to health-care students, where students finding listening to the patients' perspectives beneficial and memorable.[9] Chen et al (2008) assessed the impact of students 'becoming the patient' when they simulated the life of chronically ill patients and concluded that this method improved the level of empathy demonstrated by pharmacy students.[10]

An alternative approach to the use of simulated patients in teaching is to employ active learning and involve students in shaping the way the teaching session is run.[11] Mock medicine simulation scenarios using either sweets or placebo tablets have been used to teach pharmacy students about the patient's perspective of medicine-taking.[5,12,13,14] Whilst these teaching methods have been shown to enhance student empathy and understanding of the challenges patients face when taking medication on a daily basis, the studies tend to focus on the unintentional reasons for non-adherence. There was no explicit objective for exploring students' reasoning for non-adherence or indeed general awareness of the different types of non-adherence.

This study therefore aims to explore students' awareness of unintentional and intentional non-adherence when asked to reflect on a 1-week mock medicines teaching activity.

Three key objectives were set in order to achieve this aim;

1) To engage students in a 1-week mock-medicine taking activity and completion of a self-report proforma to capture the number of doses taken

2) To establish the percentage self-reported adherence and identify the reported reasons for non-adherence.

3) To explore the extent to which intentional and unintentional reasons for non-adherence were reported.

METHODS

Overview of Study Design

A mixed methods approach was used where first year MPharm students attending University in Wales were asked to complete a week long mock medicines activity and asked to provide their feedback using a standard data capture form to report the exact number taken (quantitative) and the reasons why any doses were missed (qualitative), if any. It was decided that students would be presented with a course of mock antibiotics, since that type of medicines would justify a short duration and would make the activity more realistic. It was also hoped that sharing of the results with the students would provide them with an insight into some of the reasoning for patient non-compliance to antibiotics, a major determinant of treatment effectiveness.[15,16]

Data Collection and Sampling

The full cohort of first year MPharm students (n=115) were each provided with a labelled 'mock' medicine to take for one week prior to a lecture on 'the patient's perspective in medicine-taking'. The 'mock medicine' was an original pack of 'Tic Tacs'® (sweets) and they were labelled as 'The Antibiotics' with one of five dosing regimens (Table 1). Students were asked to choose one packet at random from a box containing all the different dosing regimes.

The data capture form consisted of a table which required students to record their adherence to the mock medicine against the number of doses taken and day of the week (similar to a daily diary record). There was also space for the students to write their reflections on the activity and to provide reasons for non-adherence or justifications for their answer. These formed the basis of some discussion during the lecture and were collected by the lecturer afterwards. Feedback on the effectiveness of the teaching method was captured as part of the annual student evaluation of teaching survey.

Ethics

Students were informed that these data would be used for further analysis and asked to contact a member of the teaching team if they did not consent to their form being used in this way (no objections were received). The collected forms were anonymised by adding a unique identifier code to each form (with note of gender) and all names were removed to ensure confidentiality. A record of the coding was kept in case referral was needed. Ethics approval for the study was granted by the University School Research Ethics Committee.

Data Analysis

A database was created using IBM Statistical Package for Social Sciences (SPSS) version 20 to analyse the quantitative data. The database recorded the students' assigned participant number, gender, assigned dosing regimen, number of missed doses, number of 'tablets' the students should have taken over a 1–week period and the number of 'tablets' actually taken. An overall percentage adherence score was calculated using the number of tablets taken and the number, which should have been taken for 100% adherence. Mann-Whitney U test was used to determine whether there was a statistically significant difference in adherence scores for gender or student fee status (UK and EU or overseas student). Kruskal Wallis test was used to explore difference in adherence scores between the five different dosing groups.

The written comments and reflections provided on the forms were documented verbatim using Microsoft Word©. The comments were grouped depending on dosing regimen and then thematically analysed. Deductive analysis was used to explore reasons for intentional and unintentional adherence whilst inductive analysis was employed to uncover other recurring themes.

RESULTS

Adherence to Medication

A total number of 115 students were provided with the 'mock medicine', of these 76 (66%) completed and returned their medication adherence forms. One student was excluded from the study due to taking all the mock medicines at once. Out of the remaining 75 participants 30.7% (n=23) were male and 69.3% (n=52) were female, with 89% being home students (n=67).

Adherence scores ranged from 4% to 100% with a mean percentage self-reported adherence of 88.7% (SD=19.77) (Figure 1).

Over 75% of the students reported 80% or more adherence. No significant difference was found in percentage adherence for gender or funding status of students (i.e. whether UK / EU or overseas).

The number of packs for each of the five different dosing regimens made available to students was not evenly distributed. The number of data capture forms for each dosing schedule is shown in Table 2.

Different levels of adherence were reported within the different dosing regimens and this is shown in Table 3. However, none of these were statistically significantly different.

Missed doses

41% (n=31) of students missed at least one dose, with 59% of students not missing a single dose. The number of missed doses ranged from 0 to 27, with a mean of 1.64 (SD=3.84) as shown in Table 4.

Analysis of Student Reflections

Students provided some general comments on the mock medicine activity indicating that overall, they liked this interactive activity and appreciated the opportunity to experience

'medicines' taking for themselves. The activity was easy to relate to pharmacy practice and enabled them to understand the patients' perspective more so than the lecture alone as it helped them to explore the reasons why people don't adhere and why non-adherence is so common.

Thematic analysis revealed nine reasons which were categorised as unintentional non-adherence and one which was considered to be intentional. Table 5 presents representative quotes from each theme, where S refers to student number and R to the regimen number.

Unintentional non-adherence

The timing of the dosing proved difficult for many of the students. They reported how hard it was remembering and planning to take the medication around food and found it hard to take at the exact time. The taste of the mock medicine proved an issue for some when taking it and others reported difficulty swallowing the tablets. A busy schedule was also put forward as a reason for not remembering to take it and tiredness was reported to affect the adherence to the mock medicine, making it difficult to remember when to take a dose. The complexity of the dosing regimen was reported by students to be an issue, however some students found that having to remember to take a tablet once a day was just as difficult as the students who took one four times a day.

Students reported that adherence to the medicine was more difficult depending on the time of the week. Some students noted that taking the tablets on weekends was much more difficult than any other day of the week, whereas others found it easier as they were less busy. Both groups attributed the difference down to them having a different routine during the weekend. Students found changing their daily routines to accommodate taking the 'medicine' frustrating and challenging. Others reported that the availability of water was a hindrance when taking the mock medicine. Some students had to remember to bring a drink with them or had to buy one. Having the medicine to hand was also reported to be an issue

with the adherence where this issue was often linked to memory and planning in advance to ensure the medicine was on hand.

Intentional non-adherence

A few students commented that they did not adhere to the activity intentionally since they knew that the mock medicine was a sweet. This caused the activity to not be taken seriously, as they knew there would be no consequence of not taking the medicine. They also felt that as they did not have any symptoms they had no reminder to take the medicine.

Resources used by students

Analysis of the comments revealed an additional theme, which was the resources used by students to help them remember to take their mock medicine. Some students liked to find a way to remind themselves to take their medication, such as:

1. Keeping tablets visible as a reminder.

Students mentioned that keeping the medicines visible acted as a reminder to take it.

'Taking the medication straight after eating proved to be a difficult task, as I forgot to take them a few times, but did take them in the end as they were placed on my shelf in my bedroom where they are visible to the eye' (S38, R4).

'Every morning after I woke up, I'll take it. I put the tic-tac at a place on the table where I easily noticed it' (S63, R1).

'This was fairly easy as I kept the box on my desk which reminded me to take them' (S73, R1).

2. Setting an alarm/reminder on mobile device.

Students reported that setting an alarm or reminder on their phone was beneficial when trying to remember to take the mock medicine.

'Remembered to take the tablet every night except Tuesday. But set an alarm on my phone to ensure I did not forget again' (S21, R2).

'As it was a very simple set of instructions I found it relatively easy, other than remembering to take them at the same time. Therefore I set a reminder on my phone.'(S47, R1)

3. Recording medicine taking on paper/form.

Writing down when the medicines were taken helped students remember if and when a dose had been taken, enabling them to keep to a routine.

'It's easy to follow the instructions. I saw many of my colleagues get complicated instructions so I am glad that I had a simple one. Throughout the 'antibiotic' course, I sometimes forgot if I had taken the dose for that particular day. Luckily I kept a record by filling this form when I took the dose. Overall, I managed to complete the whole course, with correct dosages' (S74, R1).

4. Use an already existing medicine as a reminder.

Two students reported taking the mock medicine at the same time as an already established medicine.

'Relatively easy due to the fact I take antibiotics every day, so am able to take the tic-tac whenever I took my antibiotics, which are already part of my routine' (S48, R1).

'Quite well, I think I managed to take the tic-tac at roughly the same time during the week. I got into a routine, since I took one every time I used a vitamin that I use every morning. I managed to stick to one a day but did not take with water on two occasions' (S62, R1).

DISCUSSION

The objectives of this study were to establish percentage adherence to the mock medicine and gain feedback on how students viewed this activity. These were achieved since two-thirds of the students engaged with the task. This created a situation where students were required to balance taking medication alongside the challenges of day-to-day life, however, it is not known what the remaining one third of students did with the mock medicines and to what extent they adhered to the medication. Overall responses suggested the activity had a positive impression on the students learning. This outcome is also reported in other studies where student medicine simulations activities were conducted.[5, 12, 13,14] Our study found that students found the task to be more of a challenge than first anticipated, with many reporting adherence to be more difficult that they would have thought. Even the students who took the mock medicine once daily reported difficultly with the task and reported a greater understanding and awareness for the challenges experienced by patients. Overall the activity had a positive effect on the students understanding of the patients' perspectives- helping them to put themselves into the patients' shoes.

Even though the overall total adherence was high, over a third of students missed at least one dose. At first it was thought that the more complicated dosing regimen would result in poorer adherence, and although there was a trend for this to be the case, it was not statistically significant. However, other studies have found that adherence falls with an increasing complexity of dosing regimen.[17,18,19]

One of the key objectives of the study was to explore the extent to which students offered unintentional or intentional reasons for non-adherence. Even though student views on reasons for non-adherence were not collated, results from the forms were used as a focussing exercise to structure the teaching session and discuss the specific topic. It provided the lecturer with an opportunity to expand on the importance of the role of motivation, presence of symptoms, illness beliefs and attitudes towards medicines adherence and to draw on their experiences to provide examples. It is worth noting that

very few students mentioned intentional reasons on the form before attending the lecture (students were told not to add any further notes to this form during the lecture). It would be interesting to conduct a qualitative research study to interview students about their awareness of the reasons why patients may not adhere to their medicines. A further limitation of the study is that only two thirds of the students participated in the activity; it may be that those who did not complete the form were also those with less motivation and as such these may be more likely to have noted intentional reasons for poorer adherence. Another limitation of this exercise is that the issue of side effects is not as prominent as it is with real medication and therefore concerns over adverse effects was not something that emerged from the data.

Despite some other limitations with regards to the lack of follow up of non-responders and the uneven distribution of the five dosing regimes, these findings demonstrate that this teaching method was an effective way of enhancing pharmacy students' understanding of the patients' perspectives. Engagement with the activity was good and students displayed further understanding of non-adherence and appreciation of what it is like to be a patient. This model of teaching is simple to deliver and can be easily translated to the teaching of pharmacy students across other institutions both nationally and internationally.

Recommendations for future work includes a longitudinal study to research how such a mock medicines activity impacts on students' understanding of intentional non-adherence during later years of study and ultimately how it may influence the practice of pharmacy graduates.

Implications for practice and research

It is important that pharmacists are aware of the different reasons why patients may not take their medicines as prescribed. It is clear from this study that whereas first year pharmacy students are very familiar with the practical barriers to taking medication (unintentional), they are far less aware of the intentional causes of non-adherence. Whilst there are some

methodological limitations to this approach, gaining insight in to the reasons why some patients may decide not to take the medication will help improve the knowledge and skills that healthcare professionals require to target non-adherent groups and help tailor treatment advice on an individual basis.[20] It is therefore important that further research is conducted to establish the extent to which registered pharmacists (and other healthcare professionals involved in medication related consultations) are aware of the intentional reasons for poor adherence.

Conclusion

The aim of the study was to evaluate the students' experience of taking medicines including the extent of adherence and to gain feedback on the value of this teaching method on the 'patients' perspectives of medicine-taking'. The high adherence rate of the medication and high response rate of completed forms showed excellent student engagement with the activity. Results confirmed that this interactive method of learning was engaging and successful where overall students demonstrated good adherence. Regardless of the dosing regime and whether or not students missed any doses they were able to gain an insight in to the reality of having to take medicines on a daily basis. Students were also able to empathise with the many challenges that patients face when adhering to their treatment, particularly those issues which fall in to the unintentional non-adherence category. Students were much less able to articulate the intentional reasons why people might not adhere to their treatment and were less aware of these issues. This teaching method provided the opportunity to deal with this important aspect of non-adherence during the lecture and bring these issues to the forefront and make it relevant to students' experiences. Further research is needed to establish the extent to which registered pharmacists and other healthcare professionals are aware of these factors in order that they can explore these aspects during their consultations with patients.

References

1. Horne R. (2006) Beliefs and adherence to treatment: the challenges for research and clinical practice. In Halligan P, Aylward M. *The Power of Belief Psychological Influences on Illness, Disability and Medicine.* United States: Oxford University Press;115-135.

2. Horne R. (2000) Non-adherence to medication: causes and implications for care. In: Paul Gard *A Behavioural Approach to Pharmacy Practice.* Oxford: Blackwell Science Ltd; 111-130.

3. Donovan JL, Blake DR. (1992) Patient non-compliance: deviance or reasoned decision-making? *Soc Sci Med.*34(5),507-513.

4. Abdel-Tawab R, James DH, Fichtinger A, Clatworthy J, Horne R, Davies JG. (2011) Development and validation of the medication-related consultation framework (MRCF). *Patient Educ Couns.*83 (3):451-7.

5. Darbishire PL, Plake KS, Kiersma ME, White JK. (2012) An introductory pharmacy practice experience on improving medication adherence. *Am J Pharm Educ.* 76(3):42:1-8.

6. McDonough RP, Bennett MS. (2006) Improving communication skills of pharmacy students through effective precepting. *Am J Pharm Educ.* 70(3):58:1-12.

7. James D, Nastasic S, Horne R, Davies G. (2001) The design and evaluation of a simulated-patient teaching programme to develop the consultation skills of undergraduate pharmacy students. *World Sci* 23(6):212-216.

8. Schwartz B, Bohay R. (2012) Can empathy help teach professionalism and empathy to dental students? Adding patient videos to a lecture. *J Dent Educ.* 76(2):174-184.

9. Shapiro J. How do physicians teach empathy in the primary care setting? (2002) *Acad Med.* 77(4):323-328.

10. Chen JT, LaLopa J, Devra DK. (2008) Impact of patient empathy modelling on pharmacy students caring for the undeserved. *Am J Pharm Educ.* 72(2):40. p1-11.

11. Eisner EW. (1982) *Cognition and curriculum: a basis for deciding what to teach.* New York: Longman.

12. Divine HS, Cain J. (2009) Assessing the effect of a polypharmacy medication adherence simulation project in a geriatrics course in a college of pharmacy. *J Am Geriatr Soc.* 57(8):1487–1491.

13. O'Connor DM, Savageau JA, Centerbar DB, Wamback KN, Ingle JS, Lomerson NJ. (2009) Lesson in a pill Box: teaching about the challenges of medication adherence. *Fam Med.* 41(2):99-104.

14. Ulbrich T, Hamer D Lehotsky K. (2012) Second-year pharmacy students' perceptions of adhering to a complex simulated medication regimen. *Am J Pharm Educ.* 76(1):11.

15. Fernandes M, Leite A, Basto M, et al. (2014) Non-adherence to antibiotic therapy in patients visiting community pharmacies. *Int J Clin Pharm.* 36(1):86-91.

16. Kardas P. Patient compliance with antibiotic treatment for respiratory tract infections. (2002) *J Antimicrob Chemother.*49:897–903.

17. Reginster JY, Rabenda V, Neuprez A. (2006) Adherence, patient preference and dosing frequency: understanding the relationship. *Bone.* 38(4 Suppl1):S2–S6.

18. Payer J, Killinger Z, Sulkova I, Celec P. (2008) Preferences of patients receiving bisphosphonates- how to influence the therapeutic adherence. *Biomed Pharmacother.* 62(2):122-124.

19. Caldeira D, Vaz-Carneiro A, Costa J. (2014) The Impact of dosing frequency on medication adherence in chronic cardiovascular disease: systematic review and meta-analysis. *Rev Port Cardiol.* 33(7-8):431-437.

20. National Institute for Health and Clinical Excellence Quick reference guide 'Medicines adherence', NICE clinical guideline 76 (2009) https://www.nice.org.uk/guidance/cg76 Accessed June 23, 2016.

Table 1: Dosing schedules provided to students

Directions for use of "mock medicine"
1. One to be taken daily
2. One to be taken at night (at the same time)
3. One to be taken with water twice a day
4. One to be taken three times a day after food
5. One to be taken four times a day half hour to one hour before food

Table 2. Number of student returns for each dosing schedule (n=75)

Dosing regimen number	**Dosing Regimen**	**Number of Student Returns**
1	One to be taken daily	n=33 (43.4%)
2	One to be taken at night	n=13 (17.1%)
3	One to be taken with water twice a day	n=3 (3.95%)
4	One to be taken three times a day after food	n=12 15.8%
5	One to be taken four times a day half hour to one hour before food	n=14 (18.4%)

Table 3. Percentage adherence for the individual dosing regimens

Dosing Regimen	Average Total Percentage Adherence (%)	Range of Percentage adherence (minimum-maximum %)
1	96.1	29 - 100
2	79.1	29 - 100
3	90.3	71 - 100
4	93.0	81 - 100
5	83.1	4 - 100

Table 4. Missed doses of mock medicines

Number of Missed Doses	Number of students (n)	Percentage of students (%)
0	n=45	60
1	n=7	9.3
2	n=7	9.3
3-5	n=13	17.3
6-10	n=0	0
11-20	n=2	2.7
21-27	n=1	1.3

Table 5: Representative quotes from students' reported reasons for non-adherence to the mock medication activity

Reported reasons for unintentional non-adherence	
1. Timing (exact time, inconsistent intervals, in relation to food)	*'Found it difficult to take tablet at exact time. Remembered to take it every night but not at the exact hour.' (S29, R2)* *'The label didn't tell me how many hours in between each tablet I should wait (should be every 8 hours rather than after food) because I ate whenever I was hungry and didn't assume I should take the tablets after breakfast, lunch and dinner.' (S41, R4)* *'Difficult to remember to take them half an hour before food' (S4, R5)*
2. Taste of mock medicine	*'Not great, not a massive fan of the taste' (S30, R1)* *'I didn't particularly like the flavour of my medication either!' (S13, R5)*
3. Too busy/inconvenient	*'I found it surprisingly difficult to remember to take the medication, days that I was very busy, I did not take them at all but days I was less busy I remembered …'(S17, R5)* *'I completely forgot to take one on Wednesday and Saturday. This was because my day was busier than usual, or I fell asleep easy.' (S26, R2)*
4. Too tired	*'It was quite hard remembering to take them especially Monday-Friday when we had lectures and at night when I was tired…' (S8, R5)*
5. Dosing regimen	*'This was very challenging mainly because I had to remember to take them before eating, and because it was hard to remember to take four times a day.' (S9, R5)* *'I actually found taking this course of 'antibiotics' more challenging than I had first thought. Firstly, I wasn't sure whether four times a day meant 4 times over the course of 24 hours or 4 times just in a day. I went with the latter, taking the course only during the hours I was naturally awake at…' (S15, R5)*
6. Time of week (weekend)	*'The weekends were also harder especially as I don't have the same day to day routine.' (S14, R5)*
7. Changes to daily routine	*'Managed to stick to it roughly. However, I had to change my habits to accomplish this and that was quite frustrating' (S45, R1)*
8. Difficulty swallowing/availability to water	*'…I can't swallow the pills and ended up sucking it. In practice antibiotics would not taste nice so I really need to learn how to swallow one…' (S64, R1)* *'…I also found it hard to ensure I had water to take with the tablet. If I was out, the only option was to buy a bottle, which could be expensive or wait till I got home. Again this made following the course difficult.' (S53, R1)*

9. Didn't have tablets to hand	*'I found it a little difficult as sometimes I didn't have 'medication' with me and waited till I got home. Sometimes I would change my bag and forget to transfer them over. Sometimes I just forget until later…' (S56, R1)* *'Too difficult to keep time as medicine wasn't with me at all times.' (S50, R1)*
Reported reasons for intentional non-adherence	
1. No symptoms/ Did not feel it was important	*'I didn't take it a specific time at night because mentally, I didn't feel it was important.' (S18, R2)* *'Sometimes I forgot to take it. Because it is not important to me.' (S24, R2)* *'… so didn't have symptoms to remind me to take them.' (S31, R2)*

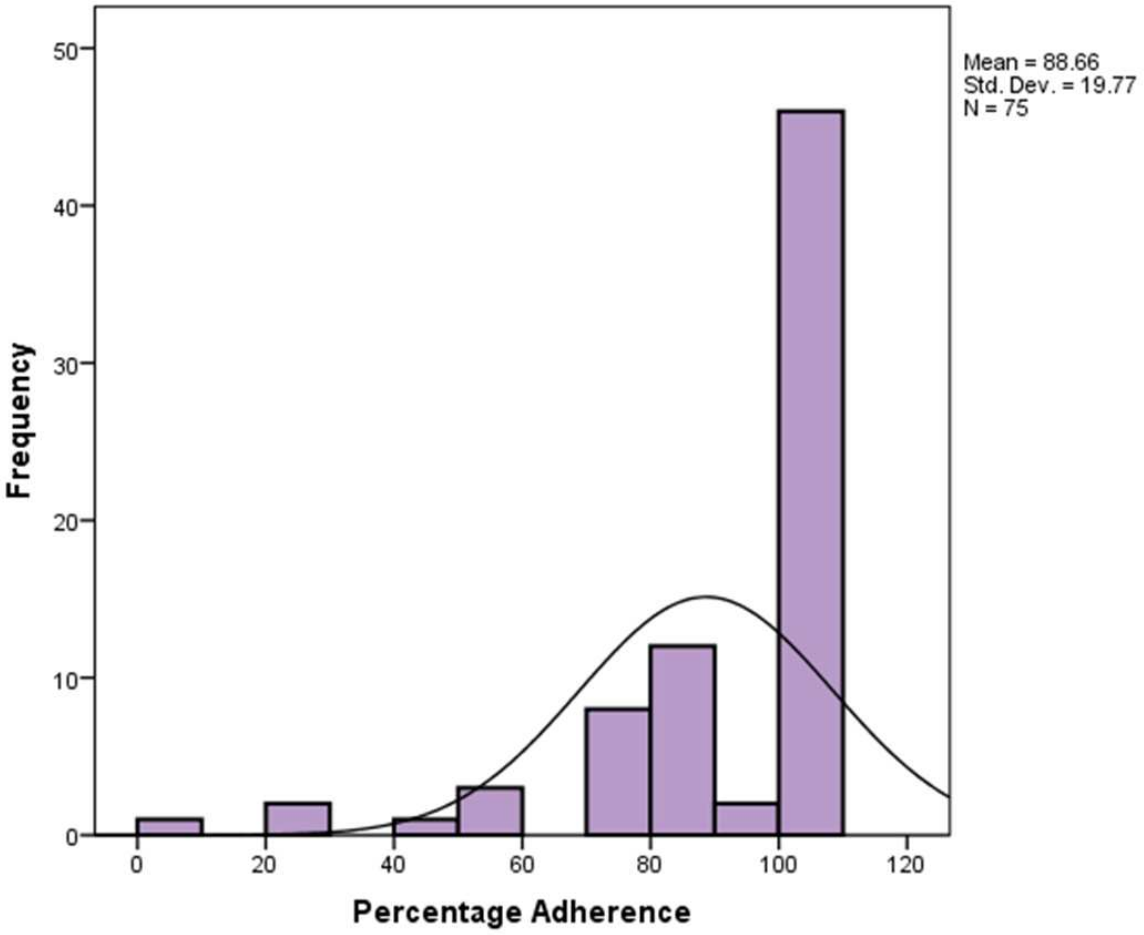

Figure 1: Frequency distribution of students' self-reported adherence scores (n=75)