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COMMON MISCONCEPTIONS ABOUT PSYCHOPHARMACOLOGY IN UNDERGRADUATE PSYCHOLOGY AND PHARMACY STUDENTS

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Abstract

College undergraduate students often hold erroneous beliefs about their disciplines that are resistant to change. Here we addressed the critical need for research aimed at assessing the educational value of game-based learning methodologies for the evaluation and amelioration of wrong beliefs in psychopharmacology. We set out to (1) examine the prevalence of inaccurate beliefs about psychopharmacology in Psychology and Pharmacy undergraduate students at European University of Madrid; and (2) evaluate whether a game-based learning methodology (i.e., Kahoot) empowered students' learning. Sample was comprised of 26 final-year undergraduate students, 10 enrolled in a Psychology degree program and 16 in a Pharmacy degree program at European University of Madrid. Teams of 5-6 students with approximately equal representation of degrees were created. Misconceptions about psychopharmacological concepts were assessed with a 10-item quiz presented with the online game-based learning tool Kahoot. Alarmingly, final-year Psychology and Pharmacy undergraduate students endorsed more than half (52.50%) of the misconceptions tested with the Kahoot test. Fortunately, students reported a major improvement (6.04 out of 7.00) in their basic psychopharmacological knowledge after this game-based learning experience. Final-year college undergraduates in Psychology and Pharmacy degrees seem to still uncritically hold widely believed myths leading to widespread misunderstanding about psychopharmacological core concepts. Game-based learning methodologies such as Kahoot may be effective at evaluating and curtailing these myths as well as promoting an engaging and motivating learning environment.

Keywords: Psychopharmacology, psychology, pharmacy, college education, misconceptions.

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1. Introduction

Among the many challenges facing psychopharmacology training today, perhaps none is more important that ensuring that undergraduate health care students learn how to apply pharmacotherapeutic principles to the safe and scientifically-based administration of psychotropic medications. Indeed, because mental health illnesses are often treated with prescribed medicine and linked to biopsychosocial factors, multidisciplinary teams in mental health care are central to help increase the efficiency of mental health care (Supper *et al*, 2015).

Belonging to these multidisciplinary teams, pharmacists play an important role in early detecting mental health conditions, improving medication adherence, and reducing mental health stigma (Rubio-Valera *et al*, 2014). Also, clinical psychologists greatly contribute to the identification, support, as well as management of mental disorders; and even in some countries, they are able to prescribe psychotropic medication (Robiner *et al*, 2013). However, opportunities for collaboration between pharmacists and clinical psychologists remain relatively unexplored or in need of further development (Supper *et al*, 2015).

Unfortunately, there are many myths surrounding the profession of psychopharmacology (Marczinski, 2014), often maintained by healthcare professionals, including psychologists and pharmacists (Lillenfeld *et al*, 2010; Marlowe and Geiler, 2012). Challenging these wrong preconceived notions of psychopharmacology probably require a special instructional effort in the classroom due to their resistance to be eradicated (Brown, 1984; Kowalski and Taylor, 2009).

Importantly, not only our college educational system should provide integrative cooperation of different health professional (e.g., pharmacists and psychologists) and address the widespread misconception about psychopharmacology, but also educators should go beyond traditional lecture models of teaching psychopharmacology and help make learning more fun and effective by using of games and new technology (Zisook *et al*, 2005; Shiroma *et al*, 2010).

2. Problem Statement

College undergraduate students often hold erroneous beliefs about their disciplines that are resistant to change and may need new instructional approaches for their eradication. Healthcare students in the areas of Psychology and Pharmacy that should work together within psychopharmacology, the discipline combining the investigation of the mind and behaviour with the study of drugs, may not be an exception.

3. Research Questions

Here we addressed the critical need for research aimed at assessing the educational value of game-based learning methodologies for the evaluation and amelioration of wrong beliefs in psychopharmacology through interprofessional collaborative practice of both Psychology and Pharmacy undergraduate students.

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4. Purpose of the Study

We set out to (1) examine the prevalence of inaccurate beliefs about psychopharmacology in final-year psychology and pharmacy undergraduate students at European University of Madrid; and (2) evaluate whether a game-based learning methodology (i.e., Kahoot) empowered students' learning of basic psychopharmacological knowledge.

5. Research Methods

Sample was comprised of 26 final-year undergraduate students with an average age of 23 (range going from 21 to 35), 10 enrolled in a Psychology degree program and 16 in a Pharmacy degree program at European University of Madrid. The majority of students were female (69%). Teams of 5-6 students with approximately equal representation of degrees were created. Misconceptions about psychopharmacological concepts were assessed with a quiz with 10 multiple-choice questions presented with the online game-based learning tool Kahoot (see Table 1). Kahoot's learning games can be played with any mobile device with an internet connection and are commonly used to review students knowledge. Basic psychopharmacological knowledge and drug misconceptions were assessed with an ad-hoc questionnaire asking for their level of improvement in that class, being 1 no improvement and 7 a big improvement.

Table 1. Misconceptions about psychopharmacological concepts assessed by the kahoot quiz (correct responses are in bold).

QUESTION	OPTION 1	OPTION 2	OPTION 3	OPTION 4
Select the CORRECT statement about marijuana:	"Marijuana is not addictive"	"Marijuana impairs long-term memory"	**"Marijuana has been linked to psychosis"**	"Marijuana can cure cancer"
People can abuse and become addicted to a range of medications, EXCEPT for:	**"Antipsychotics"**	"Opioids"	"Barbiturates"	"Benzodiazepines"
Select the CORRECT statement about ulcers:	"Ulcers are caused primarily by stress"	**"An infection is the leading cause of developing ulcers"**	"Spicy foods cause ulcers"	"Ulcers are the result of underlying psychological conflict"
Select the INCORRECT statement about autism:	"No medication can improve the core signs of autism"	"Around 1% of people are now thought to have autism"	"Only 0.05% of them have truly outstanding savant ability"	**"People with autism are asocial and uncaring"**
All but this is rarely portrayed about dementia at the movies:	"Patient's agitation"	**"Patients going wandering"**	"Patients being treated with psychotropic drugs"	"Experience of visual hallucinations"
Spain has suffered from the highest _____ prevalence rates in Europe for the last decade.	"Marijuana"	"Ecstasy"	"Heroin"	**"Cocaine"**

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Select the INCORRECT statement about the chemical imbalance theory of mental illness:	"They link emotional states with levels of monoamines"	"This idea is proving increasingly popular"	**"Most antidepressants are much more effective than placebo"**	"No one knows what "correct" levels for neurotransmitters are"
Select the CORRECT statement about oxytocin, the "love" molecule:	"Extra oxytocin can increase feelings of envy"	"Oxytocin can reduce trust toward outsiders"	"Oxytocin can increase aggression toward partners"	**"All the answers are correct"**
Select the INCORRECT statement about statins:	**"Statins are strongly associated with cognitive dysfunction"**	"Their cardiovascular benefits out-weight other harms"	"Statins reduce cardiovascular mortality and morbidity"	"Statins reduce levels of low-density lipoprotein cholesterol"
Select the CORRECT answer about crack babies:	"Cocaine-exposed children show less intelligence"	"These kids grow to be either addicts or criminals"	"Its effects are more severe than for alcohol"	**"Poverty is more important than being exposed to cocaine"**

Data are represented as means ± standar error of the mean (SEM) or percentages. Statistical analyses (t-test for independent samples) were performed with the statistical software SPSS version 21. An alpha level of 5% was considered statistically significant.

6. Findings

Alarmingly, final-year Psychology and Pharmacy undergraduate students endorsed more than half (52.50%) of the misconceptions tested with the Kahoot test. Fortunately, students reported a major improvement (6.04 out of 7.00) in their basic psychopharmacological knowledge after this game-based learning experience. No statistical differences were found between degrees (t_{24}=1.11; p=0.28), although as shown in Figure 1, Pharmacy students (6.19 ± 0.16) showed greater scores than Psychology students (5.80 ± 0.36).

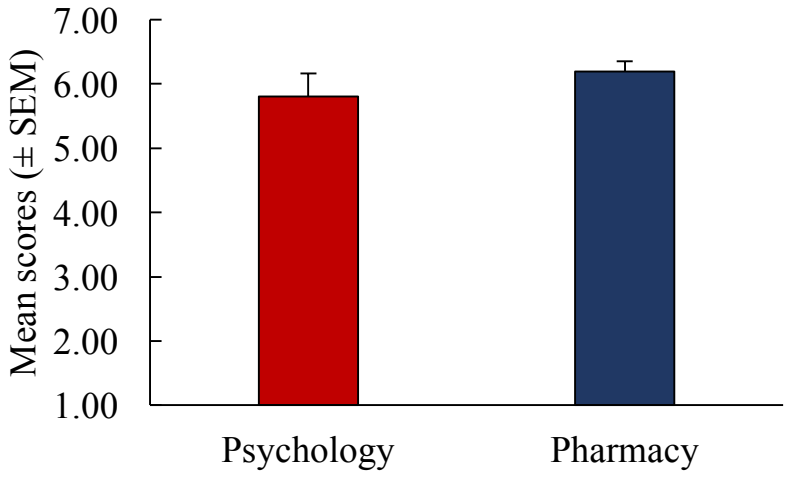

Figure 1. Level of improvement by degrees in basic psychopharmacological knowledge after the game-based learning experience. Students reported a major improvement (almost the maximum score of 7), but no statistical differences were found between degrees.

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7. Conclusion

Final-year college undergraduates in Psychology and Pharmacy degrees seem to still uncritically hold widely believed myths leading to widespread misunderstanding about psychopharmacological core concepts. Game-based learning methodologies such as Kahoot may be effective at evaluating and curtailing these myths as well as promoting an engaging and motivating interprofessional collaborative learning environment.

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