

## ARTICLE

# Raising Awareness About Prescription and Stimulant Abuse in College Students Through On-Campus Community Involvement Projects

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As prescription stimulants become more common on college campuses, concerns have been raised about the abuse of these drugs by college students. Estimates are that up to 20% of college students abuse prescription stimulants, most often by ingesting medications not prescribed to them. In an effort to raise awareness and disseminate information about the potential harmful effects of abusing prescription stimulants, students enrolled in a Health Psychology course participated in small-group

community involvement projects. This paper describes the value of such projects, details the specific projects completed by the students, how the projects were graded and assessed, and discusses the usefulness of these and similar projects in neuroscience-related courses.

*Key words: stimulant abuse, Ritalin, Adderall, Vyvanse, community involvement projects*

The presence of prescription stimulants on college campuses has risen significantly in recent years (Weyandt et al., 2013). In 2010, methylphenidate (Ritalin) was the medication most widely-prescribed to adolescents, a 50% increase from 2002 (Chai et al., 2012). Methylphenidate, Dextroamphetamine (Adderall) and Lisdexamphetamine (Vyvanse) are also typically prescribed to students to increase attention and focus, and to improve overall academic performance. Although recognized for their efficacy in students diagnosed with either ADHD (attention deficit hyperactivity disorder) or ADD (attention deficit disorder), prescription stimulants pose potentially deleterious effects if consumed by those without a prescription.

Recently, concerns have arisen over the abuse of stimulants by students without a prescription for these medications. Estimates are that up to 20% of college students abuse prescription stimulants for recreational or academic purposes (e.g., being able to study for longer periods of time; Benson et al., 2015), most often by obtaining the medications from peers who hold prescriptions for the drugs. Potentially dangerous health effects from ingesting non-prescribed stimulants include cardiac irregularities, elevations in blood pressure, dependency (with frequent use), and paranoia (Lakhan & Kirchgessner, 2012). In addition to these potential effects, recent work indicates cognitive dysfunction in college students who misuse prescription stimulants, including dysfunction in self-monitoring and abnormalities in working memory (Wilens et al., 2017). Importantly, combining prescription stimulants with other substances may magnify the effects of one or the other compounds. For example, combining Ritalin or Adderall with alcohol may mask the amount of alcohol consumed, putting the individual at greater risk for alcohol overdose or toxicity (Egan et al., 2013).

Research has shown that those students most at risk for prescription stimulant abuse are males, members of Greek organizations, students who consume other substances recreationally (including alcohol), and students

who self-report as being more “invincible” (Wickman et al., 2010; Kennedy, et al., 2018).

As part of an ongoing effort to raise awareness and stimulate discussion on the issue of prescription stimulant abuse on our campus, students enrolled in a Health Psychology course participated in small-group community involvement projects. Integrating community involvement projects can have a number of positive learning outcomes. Students become more aware of important issues within their communities/campuses, and the projects can “enliven one’s sense of agency” by having students participate in projects that take place outside of the classroom (Snyder, 1990). Moreover, involvement in community-based projects can increase student confidence in assuming subsequent roles as leaders (Simons et al., 2011).

In addition to the benefits of community involvement projects, there are a number of well-documented advantages of group work, particularly when group projects reflect material relevant to that covered in class. For example, group work in college students has been shown to enhance communication skills, facilitate opportunities to consider ideas and perspectives that differ from one’s own, and participate in important decision-making regarding the task of the group project (Bennett & Gadlin, 2012; Mead and Kennedy, 2012). Furthermore, group work has been linked to increased individual achievement relative to students who tackle a project alone (e.g., Johnson et al., 2014).

This paper describes how the community involvement projects were integrated into the course, the specific projects in which students were engaged, the ways in which the projects were assessed by both the instructor and the students, and how similar projects might be integrated into a number of neuroscience-related courses.

## COURSE DESCRIPTION

Health Psychology is taught as a 200-level elective course at Denison University. Although the only prerequisite for the course is Introductory Psychology, the majority of students enroll in the course from many disciplines, often

having completed a number of courses in their respective majors. In the fall semester of 2017, 17 sophomores and juniors were enrolled in the course. Although the majority of enrolled students were Psychology majors, other disciplines were represented in the class, including Biology, Communication, and Health, Exercise and Sport Studies.

The course was taught from the perspective of the Biopsychosocial Model of Health and Wellness, which emphasizes that health and wellness represent the complex interactions between biological, psychological, and social factors. Students were introduced to the community involvement projects early in the semester, during discussions of health compromising behaviors (drug misuse and abuse). The instructor presented the topics for the projects by first describing the severity of the problem of prescription stimulant abuse in college students, and then explaining the value of working with others on projects that have the potential to increase awareness and create change in our communities. Students were asked to provide the instructor with their “top three” choices from the pre-determined project ideas; small groups were assigned based upon student preferences.

## DESCRIPTION AND REQUIREMENTS OF THE PROJECTS

The four community involvement projects were as follows:

1. Writing at least two articles aimed at college students designed to increase awareness of the problem of prescription stimulant abuse.
2. Creating flyers for first-year dormitories and tri-folds for first-year dining halls informing students of the possible dangers of abusing prescription stimulants.
3. Working with our campus health center in efforts to solicit students to complete an online course aimed at assessing knowledge about prescription stimulants.
4. Visiting first-year Advising Circles, to raise awareness and engage in discussion of the problem of prescription stimulant abuse.

Groups consisted of three to five students. The students were required to meet with the instructor as the specific plans for their projects evolved. Typically, each group met two to three times with the instructor. For all projects, students were responsible for locating and reading any primary literature that they integrated into their projects (for example, the pharmacology of stimulants, including pharmacokinetics and pharmacodynamics), for contacting instructors of Advising Circles (group 4) to obtain permission to visit their classes during the semester, and to obtain instructor approval for posters, tri-folds, and articles. Generally, the first meeting with the instructor consisted of students sharing their ideas for the project; subsequent meetings took place as materials and content of the projects materialized more fully. Meetings with the instructor also provided opportunities for students to

discuss primary source material, to ask questions, and to clarify information to be used in the final projects. Projects consumed the final few weeks of the semester, on average. During the last week of the semester, students shared the successes and challenges of their projects with the class.

## THE FINAL COMMUNITY INVOLVEMENT PROJECTS

The final community involvement projects are described below. Links to the Synapse paper is provided in the text below; materials from other projects are provided in the Supplementary Material section of the paper.

1. The five students in the article writing group created two feature articles, each intended for a slightly different audience. The first, targeting Denison’s general student body, was published in *The Denisonian*, our college newspaper. This article, entitled “A Call to Our Peers” (Supplementary Material 1A) was written shortly before final exam week, a time known to be risky in terms of students sharing their prescription medications with others. The article alerted students about the problem of prescription stimulant abuse, the potential consequences of abusing drugs not prescribed to them, and offered some study hints to students in an effort to encourage efficient studying without the abuse of prescriptions. The second article was written to provide more technical information to a more science-savvy audience. This article, entitled “Brain-Boost: The Dangers of Stimulant Abuse in College Students”, was submitted and subsequently published in *Synapse*, an intercollegiate science magazine founded and run by students at Denison and Oberlin College (Reardon et al., 2018). This article provided information on how stimulants work at the level of the neuron, the neurotransmitters involved in the mechanism of stimulants, and other important information regarding the pharmacology of these drugs.

2. Students created colorful flyers and distributed them within first-year dormitories on campus. In addition to the flyers, trifolds were created and distributed on tables in the dining halls, designed to provide information and stimulate discussion about prescription drug abuse. Posters and trifolds (examples in Supplementary Material 1B) included the hashtag “you are not invincible” (#youarenotinvincible), which provided students the opportunity to engage in online discussion with others about the problem of stimulant abuse by college students.

3. One group of students worked closely with our campus health center to increase student participation in an online stimulant knowledge survey created by EverFi. The questionnaire is used by our health center as part of their effort to educate our students about stimulant drugs. This group reached out to members of Greek life and to other campus organizations to solicit participation in the survey. In addition, this group of students created informative handouts that were distributed to students attending the

end-of-semester “de-stress fest”, hosted by the health center (Supplementary Material 1C).

4. The final group of students coordinated visits to Advising Circles with the instructor of those hour-long, once-per-week courses designed to work with first-year students as they adjust to the demands of college. For this project, the students created a “script” to follow in each of the Advising Circles. They first discussed the dangers of prescription drug abuse with their younger peers, described some common myths regarding stimulant abuse, and then solicited anonymous written questions from them that served as discussion topics for the group. Most of the students enrolled in Advising Circles had had either direct or indirect knowledge of stimulant abuse on campus, and often asked about what steps they should take if they encountered someone selling the drugs to students without prescriptions, or how to respond if one of their peers was misusing or abusing the drugs. Handouts summarizing the dangers of abusing prescription stimulants were also created to give to the students. The script and handout are provided in Supplementary Material 1D.

## ASSESSMENT OF THE COMMUNITY PROJECTS

Community involvement projects constituted 15% of the students’ overall course grade. The instructor assessed the student projects at the end of the semester. Assessments were based upon a number of criteria, including how prepared students were at each of the meetings with the instructor, the background that led to the project content, and the final clarity, quality and content of the project. As can sometimes be the case with group projects, not all groups produce products that are of equal quality. Because of tardiness in organizing instructor meetings and lack of preparedness at these meetings, one of the groups (the group creating flyers and trifold) created final products that were of lesser overall quality than the other three groups; this was reflected in the project grade for these students.

In addition to instructor assessment, students completed short peer evaluations for each of their group members. The evaluations asked students to “rate” each of the members of their groups on their overall contributions to the project idea (including finding resources relevant to the project), preparedness at meetings outside of those with the instructor, and attendance at meetings held outside of class time. Group members were rated as “0” (never), “1” (sometimes), or “2” (always). Students were also encouraged to reflect on each group member’s contribution and provide additional written feedback to the instructor about each group member.

All students rated their group members with “2”s for each of the three items. Comments reflected student satisfaction with the projects. Some students reported that working with their group members was a good experience. Others commented that, although finding time outside of class was difficult, the group worked well together and all

group members shared equally in the workload required of the project.

Also at the end of the semester, students (n=17) were asked to complete a short, five item Likert Scale to assess whether some of the goals of the project had been met. The questions, along with mean values for each, are provided below; items were rated using the following scale:

- 1: strongly disagree
- 2: agree
- 3: neither agree nor disagree
- 4: agree
- 5: strongly agree

1. The community project helped me in working collaboratively with peers, considering alternative viewpoints as we worked toward a common goal. (4.0/5.0)

2. The community project helped to raise my awareness of some of the issues related to prescription stimulant abuse present on our campus. (4.4/5.0)

3. The community project made me think more deeply about some of the challenges we face on campus regarding drug abuse, and ways we might begin to address these challenges. (4.2/5.0)

4. I got a better sense of the challenges required to create change with respect to college student drug abuse. (4.3/5.0)

5. The community project helped me to integrate and implement information we learned in the course with “real world” application of the material. (4.1/5.0)

## DISCUSSION: STRENGTHS AND CHALLENGES OF THE COMMUNITY INVOLVEMENT PROJECTS

Overall, the community involvement projects were successful in integrating course-related material into an activity which students were able to relate. Students reported satisfaction with the projects, with working in small groups, and gained an appreciation for the extent of the problem of prescription stimulant abuse and the challenges faced in attempting to create change and raise awareness about the issue on our campus.

Projects similar to those described in this paper can offer several advantages and opportunities to enrich a neuroscience-related class. Involving students in projects that are connected to course material has shown to be especially beneficial to student learning (Markus et al., 1993; Mead and Kennedy, 2012). By providing general information on drug use and drug effects in class lecture, students had the “backbone” information that enabled them to integrate literature into their projects, and to discuss points that required more explanation in multiple meetings with the instructor.

Structuring projects in such a way that students are not required to work at off-campus sites make it easier for busy students to organize group meeting times and project planning sessions on campus without the need to plan for

and coordinate driving to locations away from campus. Moreover, some of the projects (e.g., the Advising Circle project) provided the students the opportunity to meet and interact with first-semester students about an important and meaningful issue, and therefore serve as more senior “role models” to our younger students. Students in the article writing group were able to reach large audiences through their work, both on campus (*The Denisonian*), as well as throughout our consortium of colleges (the *Synapse* paper).

The projects do have some challenges, however. Clearly, small classes are the most ideal for student work requiring multiple meetings with the instructor and for the instructor to effectively keep track of many projects simultaneously. Projects like the ones described in this paper would be very difficult, if not nearly impossible, to employ in classes with large enrollments. In addition, although the work required for these projects was limited to on-campus sites, our students tend to be involved in a number of activities and organizations, and as such, having groups find a common out-of-class meeting time was sometimes difficult. Finally, one of the group projects (working with our on-campus health center) turned out to be less successful than the other three projects. Student response rates to requests to take the online stimulant knowledge exam were lower than the group had hoped. The target was to reach participation by 50 students, but only about a dozen or so students responded to requests to complete the survey. Fortunately, the students in this group found more success in distributing their trifold to students that attended the campus “de-stress fest” at the end of the semester.

Although the projects described in this paper were part of a course in Health Psychology, other neuroscience-related courses would lend themselves quite well to similar kinds of projects. In fact, the interdisciplinary nature of neuroscience makes it a particularly well-suited discipline for community or service projects. For example, Kennedy (2016) integrated “action projects” addressing campus alcohol abuse in a Psychopharmacology course and Mead and Kennedy (2012) incorporated service learning projects into their “Sex, Gender and the Brain” and “Introduction to Neuroscience” courses. Such projects provide valuable experiences not only for majors and minors, but for all students enrolled in the course.

Finally, although the overall objective of the projects was to increase community awareness on the issue of prescription stimulant misuse and abuse, it is not possible at this time to determine the impact that the projects had on our campus community. The projects are one component of a larger, ongoing effort to inform and educate our students, and to engage our campus community in conversations about the issue of prescription stimulant abuse.

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