House’s physiology

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Even though its effects on the young population are still a matter of debate, television is certainly one of the most successful types of mass entertainment in Western culture. In 2015, the percentage of television sets per capita reached 104% in Brazil and 148% in the United States, above the world average of 76% (2). The rise of streaming media services is also responsible for a greater diffusion of television content, due to the ease access to a high number of titles, the absence of advertising, and the control over when media is watched. The provider of internet streaming media Netflix reported 69.17 million subscribers worldwide in October 2015, including 43.18 million in the United States alone (5). Given the importance of broadcast media, it is possible to assert that university students are, to some degree, influenced by television content. Czarny et al. (3) reported that 89% of medical students and 81% of nursing students at Johns Hopkins University watched medical dramas, a genre of television program set in a hospital or any medical environment. Medical dramas have been used several times as a tool for bioethics education (1, 4, 8) and can be a viable method to help health students to understand physiological processes and their applications to practical situations and to stimulate critical thinking about scientific information in media. It is also remarkable in terms of adapting teaching methods to the globalized reality of young students (6), and fictional characters and their roles as pop culture icons can be useful to facilitate communication of scientific concepts, as they can turn the learning process into something pleasurable and fun (8).

We used the television show “House M.D.” as a teaching tool during a final task in the human physiology course for undergraduate nursing students at the Federal University of Espírito Santo. At the end of the semester, 29 students were instructed to gather in 5 groups. Then, we randomly assigned one episode to each group: season 1, episode 16: “Heavy”; season 3, episode 10: “Merry Little Christmas”; season 7, episode 02: “Selfish” and episode 17: “Fall From Grace”; and season 8, episode 13: “Man of the House”. We watched those episodes before the activity, and they were chosen because of the broad range of topics they cover, including neurophysiology, endocrinology, metabolism, excretion, gastrointestinal function, and cellular, cardiovascular, and respiratory physiology. The task consisted of the following: 1) watching the given episode, 2) presenting the story of the episode, and 3) promoting a discussion in class considering the physiology content of each episode. The task was performed as the final activity of the semester, when the whole content of the course had already been studied. Although there are other subjects during the episodes, such as pathology and pharmacology, students were instructed to emphasize the physiological aspects that were presented, highlighting how physiological systems work under normal conditions and how homeostasis was altered in the pathologies displayed in the episode. Students were also free to point out any scientific inaccuracies they found and try to correct them using their current knowledge. Besides the episode, students could also consult the professors or use their physiology textbook of preference and other reliable sources of information to prepare for the presentations. Each group had 30 min to present and discuss its episode with the help of slides and any other multimedia resource of choice. If a given episode was about a respiratory disease, for example, we conducted the discussion in topics such as physical aspects of ventilation, mechanics of breathing, and transport of gases. A period of time was reserved after each oral presentation for the professors and students to ask questions and make comments. After all presentations concluded, each student was asked to answer a questionnaire to give their opinions about the activity. The questionnaire was given in writing, and all identifying information was removed. The questions included on the questionnaire are shown in Table 1.

In the first question, the students were asked to choose 3 of 10 words that best described the activity. There were five positive terms and five negative terms that were randomly spread to be selected. Figure 1 shows that “challenging” (31%) and “stimulating” (21%) were the most circulated words. Also, it should be emphasized that the term “not applicable to the course” was not even chosen once, and the term “worthless” was chosen only once. “Tricky” was the most common negative work used by the students. When the words were analyzed into two groups of positive or negative, 74% of the choices were positive words, whereas 26% were negative words, which allowed us to understand that the activity was well evaluated by the students. More than 75% of the students answered that the activity increased their interest in physiology (79%) and facilitated their learning (76%) and that they enjoyed the activity overall (83%). Moreover, questions with free answers were also analyzed, and interesting comments and compliments were observed, such as “the activity aided to connect basics concepts learned in the physiology course to its application in a clinical setting,” “the activity stimulated to review many topics studied during the semester and to see physiology as a continuum, not as isolated systems,” and “the activity encouraged to judge academic content on [television] shows.” Finally, we also asked for suggestions to perform the activity again in the future. Many of the students (76%) gave some ideas. The most frequent suggestion was to perform the activity
at more than one date. Since students presented the five episodes at only one date (total of 5 h), they suggested that the activity could be separated into two dates.

As a general evaluation, we may say that it was a well-received activity by the students. Although there were too many presentations on the same day, we agree that each episode may be well explored in more time. Based on this experience, we believe that a 90- to 120-min activity would be ideal for each episode. At the beginning of the project, we thought that groups of five to seven students would be too large, but we realized that the activity was laborious enough to deserve groups of this size. The directed question that we asked at the end of each presentation related to both the episodes and whole course, and it demonstrated that the personal involvement and use of the episode really stimulated the students to further investigate the physiology of each episode. Another very interesting point that should be emphasized was about the judgments that students made regarding what is shown on television programs. Students realized that although the show was a medical television drama, there was some information that was not well explained in the episodes. Finally, we believe that using the television show “House M.D.” as a final task to our course increased the interest of the students in all areas of physiology.

DISCLOSURES
No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS

REFERENCES

Table 1. Questions applied in the questionnaire

<table>
<thead>
<tr>
<th>Questions</th>
<th>Possible Answers</th>
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<tr>
<td>1. Choose three terms that best describe the activity.</td>
<td>Positive terms</td>
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</table>
| | • Entertaining
| | • Stimulating
| | • Challenging
| | • Enlightening
| | • Smart
| | Negative terms |
| | • Not applicable to the course
| | • Tricky
| | • Worthless
| | • Demotivating
| | • Uninteresting
| | Agree
| | Disagree
| 2. The activity increased my interest in physiology. | Agree
| | Disagree
| 3. The activity facilitated my learning overall. | Agree
| | Disagree
| 4. I enjoyed the activity performed. | Agree
| | Disagree
| 5. What was your overall opinion of the activity? | Descriptive question
| | Yes
| | No
| 6. Would you suggest this activity to be performed in another way? If yes, please give your suggestion. | Descriptive question

Fig. 1. Percentage of each answers in question 1. Black bars represent the positive terms and white bars the negative terms.