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Engaging Emergency Medicine Influencers in Sex- and Gender-based Medicine: Lessons Learned from the Sex and Gender Interest Group in Emergency Medicine and the SAEM Jeopardy Game

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ABSTRACT

The Sex and Gender in Emergency Medicine (SGEM) interest group of the Society of Academic Emergency Medicine (SAEM) was established to increase research and to disseminate knowledge about the influence of sex and/or gender in acute care medicine and on patient outcomes. To help facilitate these goals, over the past 4 years, SGEM has created, delivered, and honed a Jeopardy-like scientific quiz game for the annual SAEM national meeting. Here we describe the SAEM Jeopardy Game's development, implementation, evolution, and outcomes as well as our targeted approach to access and engage emergency medicine stakeholders in its participation.

NEED FOR INNOVATION

More than 25 years ago, the National Institutes of Health (NIH) implemented a policy requiring grant applicants to include both males and females in human clinical trials. In 2015, they expanded this mandate to include preclinical biomedical research.¹⁻³ Even with the NIH prompts and continually mounting evidence identifying clinically important sex and gender differences in disease, pharmacology, therapeutic interventions, and medical outcomes, the earnest inclusion of the variables of sex and gender into mainstream medical research and clinical care has been slow to occur. As many sex- and gender-based medicine

(SGBM) principles are directly related to acute care, we, as leaders of Sex and Gender in Emergency Medicine (SGEM) Interest Group at SAEM, identified a need to accelerate education surrounding SGBM within academic emergency medicine (EM).⁴⁻⁷ This innovation paper describes how a Jeopardy-like game may facilitate knowledge translation of SGBM principles to academic emergency physicians (EPs) to enhance their use in clinical care, teaching, and research.

BACKGROUND

The first didactic featuring sex as a biologic variable in EM was presented at the SAEM Annual Meeting in

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2007—it was attended by *two* registrants. The SGBM in EM awareness gap was further highlighted by a 2011 systematic review showing that although 18% of EM-driven original research publications reported sex and gender as independent variables, only 2% analyzed them as a primary or secondary outcome.⁸ This gap was the impetus for the 2014 Gender-Specific Research in Emergency Care Consensus Conference.⁹ The conference was attended by EM researchers, clinicians, and policy leaders, and it established a research template to identify and correct knowledge gaps in EM initiated projects.⁹ Importantly, it also was a catalyst for the formation of SGEM. Since its inception, SGEM has contributed didactic sessions to every national SAEM conference and now has over 230 members. A keystone project of SGEM has been its creation of the SAEM Jeopardy game (SJG).

OBJECTIVE OF INNOVATION

The SJG was created as a novel platform to educate and engage the EM community about the importance sex and gender in emergency care.

DEVELOPMENT PROCESS

Gaming methods have been described for over 20 years as augmentation tools for teaching biomedical sciences, and EM has embraced their use in ultrasound and simulated educational sessions such as

Sonogames and SimWars.^{10,11} SJG was developed as a game using a PowerPoint template. In the inaugural 2016 game, SGBM categories were chosen by SGEM expert consensus. Since then, questions have been updated primarily by the lead author using multiple sources including SGBM reference texts, SGBM flagged research from Google Scholar Alerts, practice changing studies collated by SGEM, and research highlighted in popular media.^{12,13} The questions are then peer-reviewed and revised by other SJG committee members. The format of questions varies and has included questions with binary or short answers as well as those requiring interpretations of echocardiograms, graphs, or ultrasounds. Embedded videos featuring prominent EM SGBM researchers have also been used. These videos included both a question and a commentary by each researcher underscoring the added value that SGBM brought to their work. In 2019, an action plan category was added to give EPs more concrete tools to increase SGBM's awareness and inclusion at their own institutions.^{14,15} A sample of SAEM Jeopardy categories, questions, and answers from previous games can be found in Table 1.

IMPLEMENTATION

The SJG was conceived to bring the routine consideration of sex and gender into mainstream clinical care for EPs. It aligned well with SGEM's mission to increase knowledge translation of SGBM within EM.

Table 1
A Sample of SAEM Jeopardy Categories, Questions, and Answers From Previous Games

Category	Question	Answer
Basic definitions	This refers to one's chromosomal and hormonal make-up	Biological sex <i>"Every cell has a sex and every individual is gendered"</i>
Heart to Heart (cardiology)	Higher stroke risk from this rhythm (with EKG showing atrial fibrillation)	Female (follow-up slide shows CHADS VASC score showing that female sex is an independent variable)
Procedures	In female ED patients > 80, half who got this common procedure did not have any clear indication for it	Foley catheter ³⁸
Crash and Boom (trauma)	In 2017, males made up this percentage of people fatally injured in motor vehicle crashes (within 10%)	71% ³⁹
Sex and Drugs (pharmacology)	Ethanol and likely zolpidem get chewed up by this stomach enzyme that is revved up by testosterone	Alcohol dehydrogenase
Research	In a recent sampling of 2008–2013 randomized controlled trials from major journals, this percentage had overrepresentation of males (within 10%)	43% ⁶
Diversity	In 2019, <i>The Lancet</i> published a study evaluating millions of papers and correlated the likelihood of reporting biological sex in write-up and published papers to this	Female gender of first or last author ³⁸

*This phrase is adapted from the Institute of Gender and Health in the Canadian Institutes of Health Research.

We started this initiative by targeting prominent EM stakeholders as game participants. By engaging them, the objective was to have these stakeholders champion the further dissemination of SGBM through their own influential networks. In addition, attracting prominent EM individuals to participate in SJG was a strategy to increase audience attendance and participation. Past SJG participants include SAEM presidents and members of the board of directors, department chairs, journal editors, prominent EM researchers, and high-profile social media influencers. Most recently we added resident and medical students board of directors (RAMs) team. Each year, stakeholders have been invited to captain a team of three players to compete against two other teams.

The game itself is played with three teams, a host, a score keeper, and at least one judge. Audience participation is encouraged both by answering questions missed by the team and by live marketing through social media. The host rewards anyone who can correctly answer the question with a small prize or a SJG branded T-shirt. At the end of the SJG, prizes are awarded for three categories: overall winner based on most points, team spirit, and social media influencer. The team receiving the loudest and most enthusiastic response from the audience gets the award for team spirit. Finally, the social media award is given to the team and its followers that post the most tweets using their team-specific hashtag that is registered with Sympplr's Healthcare hashtag project.¹⁶ Over the years, the number of hashtag-driven tweets has varied significantly between teams. With the inclusion of RAMS, we hope to increase the consistency of SJG's social media presence and generationally expand its audience.

Intentional promotion of the SJG has expanded over the past few years and now includes multiple avenues. Announcements are sent to SGEM, AWAEM, and ADIEM communication liaisons and listservs and members are encouraged to share SJG details with their own networks. In addition, we now promote SJG in the spring edition of the SAEM's official newsletter, "Pulse." Finally, we continue to work with SAEM to increase SJG's visibility on the conference's master schedule and official app.

OUTCOMES

Since initiation, SJG's attendance has steadily increased and in 2019 included over 100 participants.

Informal feedback from past team members suggests that SJG has changed their perception concerning the relevance of this material to EM.

I think "gamifying" the topic of sex and gender facilitates the discussion of a challenging topic. The number of people in the audience who often gasped at the answers, because it was new knowledge was telling. For me, there were so many areas that the questions touched upon, where I was completely unaware.—SAEM Board Member

Since its inception, the sponsorship of SJG has also expanded. SJG initially started out as an didactic solely created by SGEM. In 2018, SGEM partnered with the Academy of Women in Academy Emergency Medicine (AWAEM) and with the Academy of Diversity and Inclusion in Emergency Medicine (ADIEM). This was a natural collaboration as many gender-related health outcome disparities are exacerbated by race and sexual minority status, and several recent articles have suggested that diverse research teams are more likely to include the variables of sex and gender in their study designs.^{5,17} These relationships increased our ability to market the program and expand our audience.

Funding of this SJG has also expanded over the years. The first 2 years were funded by the Division of Sex and Gender in Emergency Medicine at Alpert Medical School at Brown University. Our initial success formed the basis for obtaining SAEM grants in successive years to cover the SJG promotional costs and awards. We have successfully partnered with SAEM's administration resulting in key benefits such as high-profile time slots (e.g., the opening reception) and recruitment of prominent stakeholders for the game.

In 2019, we shifted from institutional-based teams to organizational ones. Specifically, the last SJG had SAEM Board of Directors competing against journal editors and RAMS. The RAMS team won and appeared to be particularly knowledgeable about the gender-based questions, possibly highlighting a generational based knowledge gap in this area.

Besides sharing the content of the SJG with an increasing number of EPs at the SAEM national conference, versions of the game have been used to disseminate SGBM knowledge more broadly throughout the medical community. To date the game has been replayed at institutional grand rounds and digitally

shared with other medical educators at the 2018 Sex and Gender Health Education Summit. Finally, we are working to permanently house the game on an open-access platform “Sex and Gender Specific Health” sponsored by Laura W. Bush Institute for Women’s Health and Texas Tech University Health Sciences <https://www.sexandgenderhealth.org/>. In addition, hundreds of educational SGBM-related tweets, many of them sparked by competition for the social media award, have circulated throughout the EM community due to the game. Finally, the membership of SGEM interest group has increased a likely byproduct of increased awareness of SGBM principles.

REFLECTIVE SUMMARY

Sex and Gender in Emergency Medicine Interest Group has used several novel methods including SJG to access and engage a diverse EM audience including its key stakeholders about the importance of SGBM in acute care. Besides continuing to optimize SJG’s presence and impact at the SAEM national meeting, we intend to expand its use to other high-profile meetings to increase knowledge dissemination. A stronger format for program evaluation would be encouraged for those considering scholarly pursuits with the gamification/serious games type of interventions. Several manuscripts used in recent systematic reviews^{18,19} provide insights on how we could have evaluated our program. In this literature the most common outcomes measured were improvements in knowledge, problem solving, skills, and attitudes; rarely do they offer a measure of patient outcomes.²⁰ One of the most adaptable for our program would be modeled as a “before-and-after” assessment questionnaire similar to that used by Diehl when they improved scores on content, knowledge, and attitudes of clinicians on insulin therapy using a game.²¹ These will be important considerations as we begin collecting longitudinal data about SJG’s influence and effectiveness in SGBM knowledge translation to EM.

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