

Health edutainment and dietary habits in Saudi Arabia: Results of a population-based survey

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Introduction: Traditional nutrition education programs have shown inadequate efficacy to change the dietary behaviour alone. Recently, new approaches with proven positive impacts on dietary habits and other healthy behavior's have been innovated. These approaches depend on educating people in entertaining ways such as comics, virtual reality, gamification, video games and TV documentaries which is called "Health edutainment". These user-friendly platforms will reach all age groups to promote healthy lifestyles and wellbeing.

Objectives: The main objectives of this survey are to;(1) evaluate the community's needs in the area of health edutainment to determine the priorities and develop appropriate services' domains and (2) explore new ideas originating from the community to enhance the health edutainment program.

Methods: This was a cross-sectional observational study. Data was collected using an online population-based survey published on the website of the Saudi Ministry of Health and shared through the official twitter account. Collected data was analyzed using SPSS software after being refined and summarized.

Results: A total of 611 participants with equal gender distribution responded to this survey. Most of the participants (82.5%) were aged 20 to 44 years old. A total of 56 participants (9.2%) said that they would prefer sports and active games as health edutainment, 55 participants (9.0%) prefer TV programs and advertising, 49 (8.0%) prefer movies (cartoon, documentary or cinema), and 46(7.5%) prefer electronic games. The most commonly reported unhealthy phenomena were bad eating habits (32.1%) and low physical activity (12.6%). Obesity, nutrition, physical activity, diabetes, health awareness in general and cancer were reported by 18.7%, 17.5%, 14.1%, 8.2%, 7.0% and 5.6% of the participants as their main health concerns. The preferred edutainment methods were electronic applications (29.1%), comics (20.0%), series (16.2%) and electronic games (10.6%).

Conclusion: The health edutainment intervention should focus on healthy nutritive habits, physical activity, obesity, diabetes and cancer. Innovative approaches in health education such as games, TV shows and healthy food branding can significantly enhance the knowledge and behaviors of the Saudi society.

Key Words: Health edutainment; Dietary habits; Nutrition; Health awareness; 2030 vision; Saudi Arabia.

INTRODUCTION

A healthy diet plays a vital role in protecting people against all types of malnutrition as well as other serious non communicable diseases such as diabetes, stroke, cancer and heart diseases [1]. A recent factsheet by the Centers for Disease Control and prevention (CDC) [2] states that healthy nutrition habits in childhood and adolescence is crucial to ensure the appropriate growth and development and protect against several health disorders [3,4].

During the past decades, the global direction towards dietary behaviour change programs has been increasing. Some of these programs focused on nutrition education as a tool to eventually enhance the dietary habits of targeted populations. Undoubtedly, the knowledge gained from these programs can be a precondition to effective changes in dietary habits [5].

A review of 217 studies assessing nutrition education intervention reported that, classic nutrition education programs have shown inadequate efficacy to change the dietary behaviours by themselves where positive effects were often only achieved in multi-component interventions [6]. Hence came the idea of developing innovative approaches that can effectively change the dietary habits. Edutainment is defined as combining entertainment with education through designing and implementing programs that deliver educational content in a popular entertainment format to enhance the knowledge, attitudes, behaviours and practices of the audience [7]. Edutainment programs aim to involve the largest possible number of the targeted population in an enjoyable experience to ensure they will

participate and be positively affected by the medical content provided in an entertaining way which will eventually lead to enhancing their dietary and other health habits. These programs should be tailored to match the characteristics and the preferences of each category of the targeted populations such as considering the different genders, age groups and residential regions [8].

There are different types of games that can be used in the health-edutainment approach. These include; a) passive video games where a player is seated, b) active (Excel-games) where physical activity is required to play the video game and c) the traditional physical activity games like running and jumping without using electronic gaming systems [9].

Using passive video games, significant changes were shown in patient's behaviors such as self-management, risk reduction and increased encouragement to treatment. There are passive video games designed to change the behavior towards diabetes, asthma, eye problems and obesity [10].

Active video games can increase the level of physical activity and positively affect energy balance and could serve as a good alternative to classic fitness activities regardless of the child's BMI level [11].

Another channel of health edutainment is the media including a) fictional medical TV series, b) medical talk shows and c) non-medical movies that can emphasize the relationship between bad habits (e.g. smoking, violence, bad eating habits) and the associated negative effect on health and life. A recent systematic review was conducted to assess the influence of medical TV programs (e.g. Grey's anatomy, ER and house) on health outcomes. Results of this review suggest that fictional medical programs seem to

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influence the viewers' health-related knowledge and perceptions as well as his behaviors. And accordingly, fictional medical TV programs could be used to effectively educate the viewers about the vital health topics [12].

One of the most prominent approaches is promoting healthy food products through adding the pictures of cartoon media characters on children healthy food. The impact of this approach was investigated in several previous studies [13]. A Randomized controlled trial was conducted in the USA where it was found that branding using a familiar character "Elmo" significantly increased the fruits and vegetables intake by children. In addition, children in the intervention group (branding) experienced a decrease in their BMI compared to children in the control group [14].

Another study conducted in Belgium showed that adding the picture of a familiar media character "gnome" was associated with better appetite, higher consumption rate and higher purchases [15].

One of the objectives of the Saudi Arabian 2030 vision is to "offer a fulfilling and healthy life". As a part of the healthcare transformation projects conducted to achieve this vision, a new Model of Care (MoC) was developed that aims at activating people, creating healthy communities, promoting virtual care and enhancing primary, secondary and tertiary care. The system of care design resulted in 42 interventions; one of them was the "Health Edutainment" intervention.

In order to design and implement an effective health edutainment program that covers the specific needs of each of the targeted populations, a population-based survey was conducted to determine the population needs and preferences in the area of health edutainment. The results of this survey will be discussed in this article. This population-based survey represents one phase of the health edutainment initiative while in another phase, the opinions of the stakeholders and subject matter experts are collected and will be analyzed and interpreted to be used - along with the results of this population-based survey to develop a concept document for the initiative.

METHODOLOGY

This was a cross-sectional observational study where qualitative data was collected using an online population-based survey published on the website of the Saudi Ministry of Health and shared through its official twitter account. The survey was designed based on the inputs of 48 experienced stakeholders. Collected data was translated in English, refined and manually categorized into specified categories to enhance the process of statistical analysis and data presentation. Categorized qualitative data was afterwards analysed using IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA), version 21 for Microsoft Windows. Descriptive analysis of the data was done and the results were presented as counts and percentages.

Answers to some questions were cross-matched with age, gender and residential regions in order to identify the specific needs of each group.

Several inter-related questions were included in the questionnaire as follows;

Demographic characteristics including; age, gender, marital status, number of children and residence.

Responder's suggestions regarding the types of health entertainment programs.

Responder's source(s) of health information.

The unhealthy phenomenon in the society that needs more attention.

Health issues that are of most concern to the respondent.

The preferred entertainment health educational methods.

The most prominent reasons preventing respondents from following healthy habits.

The most important attraction to ensure continuation of practicing entertainment programs for a long period of time.

RESULTS

Demographic characteristics

A total of 611 participants took part in this survey. Gender distribution was almost equal where males constituted 50.2% of the participants. The vast majority (82.5%) of the participants were aged between 20 and 44 years old. More than one half of the participants (53.5%) were married and (42.2%) were single. Almost one half (49.3%) of the participants reported that they have no children. Most of the participants (56.8%) were from the central region of Saudi Arabia, 17.0% were from the western region, 9.8% were from the eastern region, 8.8% were from the southern region while 7.5% of the participants were from the northern region.

Suggestions regarding the types of health entertainment programs

Participants were asked about the health edutainment programs they would make if they had the opportunity and the most commonly suggested programs were sports and active games (9.2%), TV programs and advertising (9.0%), movies including cartoon and documentary movies (8.0%), electronic games (7.5%), YouTube videos (6.2%) and mobile applications (4.4%).

Source(s) of health information

Almost two thirds of the participants (65.1%) reported internet and social media as a source of health information. And almost one third (33.7%) said that doctors and healthcare professionals are their source of medical information.

Slightly less than half of the participants (44.5%) said that they check WhatsApp when they start their day. This was followed by Twitter, Snapchat and Instagram as reported by (33.7%, 14.4% and 3.6%) respectively while 3.8% of the participants reported checking other applications when they start their day.

Females were more likely to check WhatsApp and snapchat while males were more likely to check Twitter as shown in Figure 1. Age group distribution of the same results showed that participants below 19 years of age were more likely to check Snap Chat and Instagram when starting their day as shown on Figure 2.

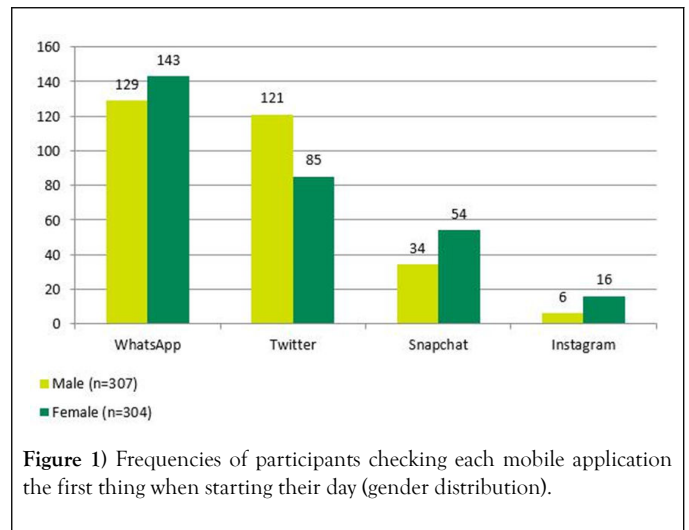


Figure 1) Frequencies of participants checking each mobile application the first thing when starting their day (gender distribution).

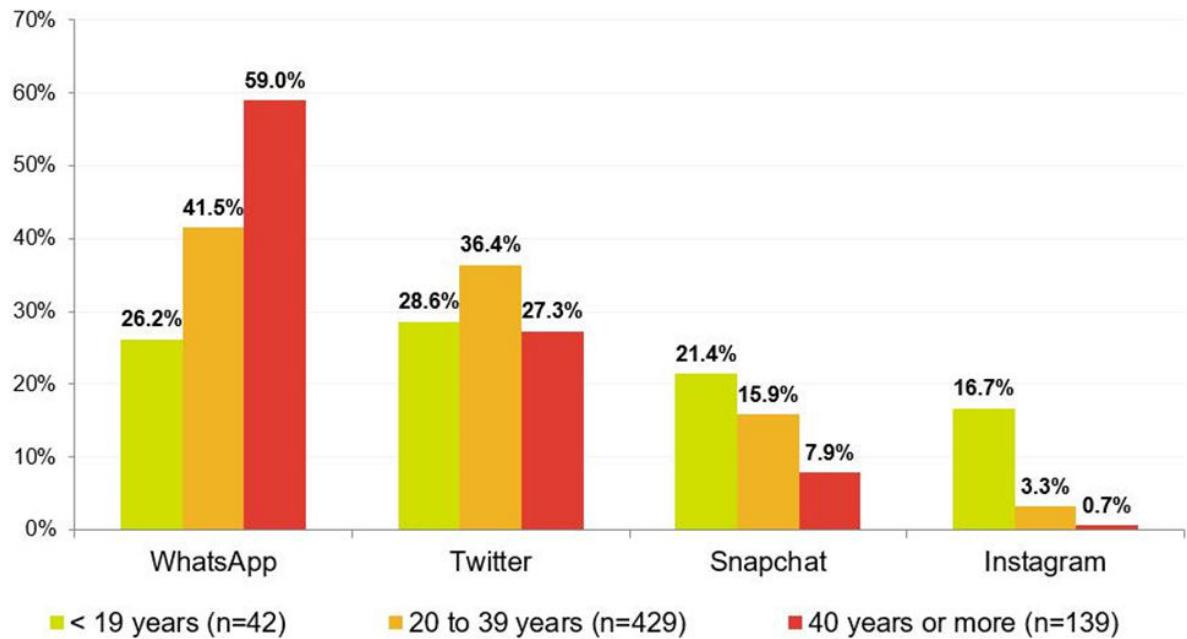


Figure 2) Percentages of participants checking each mobile application the first thing when starting their day (age group distribution).

Unhealthy phenomenon in the society

Participants were asked “What is the unhealthy phenomenon in society that you think needs more attention to correct?” where the most commonly reported unhealthy phenomenon were bad eating habits and consuming

soft drinks (32.1%), low physical activity level (12.6%), medical rumors (12.3%), smoking (11.9%), electronics addiction (8.0%), obesity (7.2%) and traditional medicine (5.6%). Other phenomenon was reported by 10.3% of the participants. More details are shown in Figure 3.

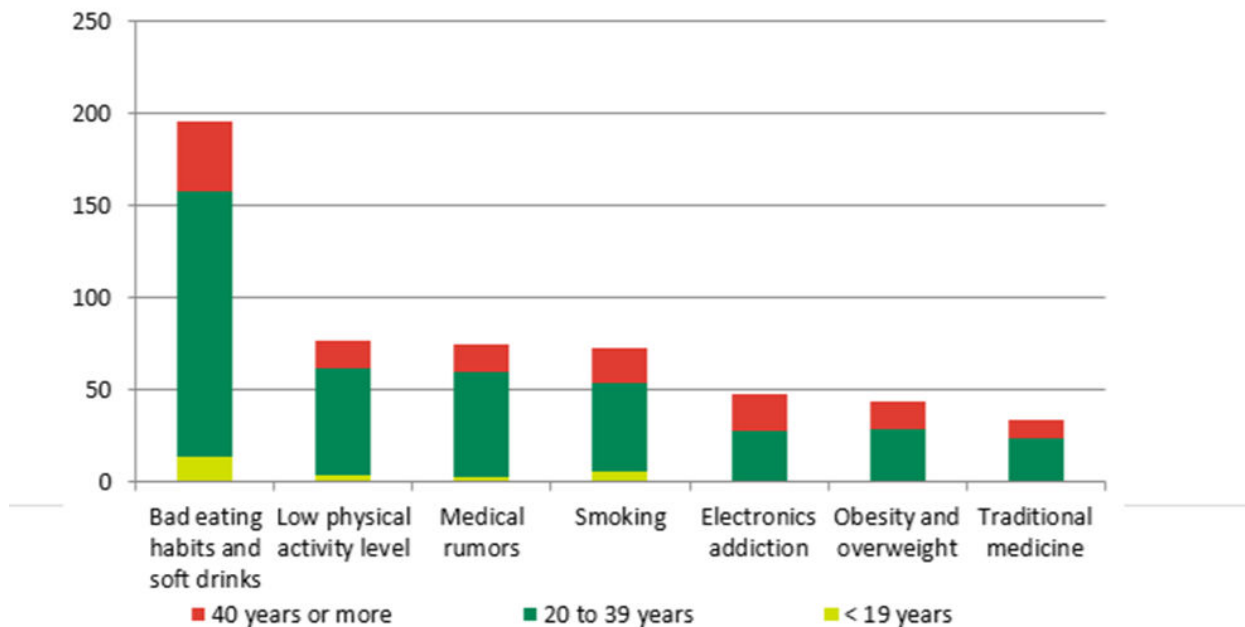


Figure 3) Frequency of participants reporting each of the unhealthy phenomenon in society.

What health issues are the population’s concerns?

The most commonly reported health-related concerns were obesity (18.7%), nutrition (17.5%), physical activity (14.1%), diabetes (8.2%), health

awareness in general (7.0%), cancer (5.6%) and psychological disorders (5.1%). Females gave more attention to obesity and nutrition while males gave more attention to diabetes, cancer and health awareness as shown in Table 1.

TABLE1
What health issue is your concern?

Health issues	Male (n=307)		Female (n=304)		Total	
	Count	Percent	Count	Percent	Count	Percent
Obesity	55	17.9	59	19.4	114	18.7
Nutrition	33	10.7	74	24.3	107	17.5
Physical activity	41	13.4	45	14.8	86	14.1
Diabetes	35	11.4	15	4.9	50	8.2
Health awareness	31	10.1	12	3.9	43	7
Cancer	20	6.5	14	4.6	34	5.6
Psychological disorders	9	2.9	22	7.2	31	5.1
Children health	6	2	14	4.6	20	3.3
Smoking	10	3.3	6	2	16	2.6
Hypertension	7	2.3	4	1.3	11	1.8
Cardiac disorders	8	2.6	1	0.3	9	1.5

The preferred edutainment educational methods

The most common preferred entertainment educational methods were electronic applications such as WhatsApp, Twitter and Instagram (29.1%),

comics (20.0%), series (16.2%) and electronic games (10.6%). Males showed higher preference rate towards electronic applications and games while females tended to prefer comics, series, exhibitions and cinema as shown in Figure 4.

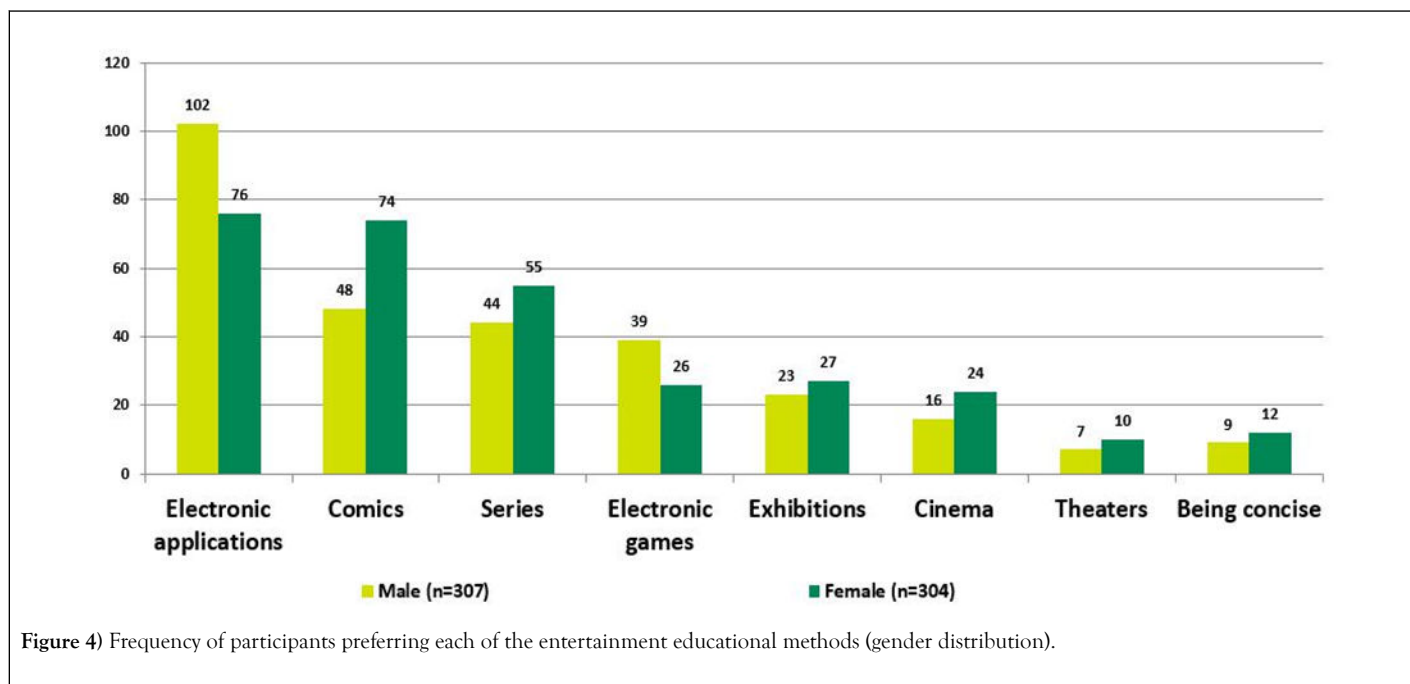


Figure 4) Frequency of participants preferring each of the entertainment educational methods (gender distribution).

Reasons preventing exercising healthy habits

Participants were asked about the most prominent reason to prevent them from practicing healthy habits. Many reasons were reported and the most frequent included not having enough time(28.3%), exhaustion and laziness (22.7%), unhealthy habits of the society (10.1%), no motivation(7.7%), financial reasons (7.2%), and no enough spaces for sports (6.7%).

Attraction to ensure continuation of practicing entertainment programs

When asked about the most important attractions to practice entertainment programs for a long period of time, the most frequent

attractions were reported to be; good and reliable content (30.1%), Short YouTube videos (21.9%), the concept of entertainment in general (7.9%), electronic games (7.7%), having free time (7.2%), non-electronic games (6.4%) and the funny/comedy content (4.4%).

Females gave more attention to the content itself while males focused on the methods of delivering the content and requested to use videos, electronic games and entertainment. More details are shown in Figure 5.

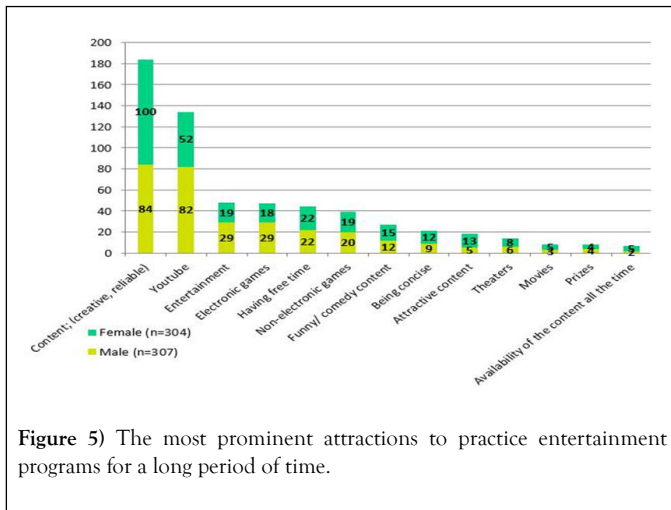


Figure 5) The most prominent attractions to practice entertainment programs for a long period of time.

DISCUSSION

The presented results showed that the most important needs of the Saudi community in the context of health edutainment include paying more attention to the bad eating habits and low physical activity level in the society. In addition, obesity and nutrition came on the top of the health issues that the Saudi population is concerned with. Moreover, diabetes and obesity were among the most frequently reported health concerns to the population while both diseases could be controlled if a healthy diet plan and life style was followed. It was noticeable that females gave more attention to obesity and nutrition while males gave more attention to diabetes, cancer and health awareness in general. These findings highlight the importance of raising the level of awareness among the Saudi community following the innovative “Health Edutainment” approach which has proven efficacy in several experimental studies conducted in USA, Italy, France, Spain, Netherlands and Hongkong [16-21].

In the current study, several barriers to practice healthy habits were reported. The most common factors were not having enough time to exercise or prepare healthy meals due to the long working or studying hours, exhaustion and laziness, unavailability and high cost of healthy food and on the other hand, the widespread and low cost of unhealthy food, unhealthy habits of the society causing lack of motivation. In the context of exercise, besides the lack of enough time to exercise, the high cost of health clubs and the unavailability of convenient and near places to exercise in (especially for females) were frequently reported as barriers to exercise.

A study conducted in Sweden among adolescents reported some barriers that prevent them from establishing healthy habits in terms of physical activity and food. The results showed some similarity to our results as the availability of temptations (fast food and candy), lack of support from the surroundings, lack of time to exercise as well as the bad weather were all reported as barriers to practicing healthy habits [22].

Taking these factors into consideration and addressing them by the concerned health authorities as well as non-governmental organizations and the private sector will significantly encourage the population to practice healthy eating habits and exercise. This could be achieved through allowing enough time during working or studying hours for exercise, ensuring the availability of healthy and tasty food in the restaurants and markets with low prices in addition to establishing health clubs with reasonable registration fees.

CONCLUSION

From the discussed results, it could be concluded that the most important needs in the context of health edutainment of the Saudi community include healthy nutritive habits, physical activity, and obesity treatment in addition to diabetes and cancer as major health concerns. The health edutainment intervention should focus on these needs and follow the recent approaches in delivering the adequate health information in

entertaining ways such as games and TV shows in addition to healthy food branding using familiar media characters. This will significantly influence the perceptions and behaviors of the population and will eventually enhance the quality of life. Future controlled studies will be needed to investigate the effects of the health edutainment program on the knowledge and behavior of the population.

LIMITATIONS

Possible limitations of our study include that the sample distribution may not be representative of the population regarding the distribution of the participants in the different regions of the Kingdom of Saudi Arabia. Another limitation is using open-ended questions which resulted in a very large number of answers to each question. In addition, suggesting logical answers to the participant to choose from would have helped the participants to better understand the objective of the question and provide a reliable answer.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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