

Research Space

Journal article

A rapid review of communication strategies for physical activity guidelines and physical activity promotion: A review of worldwide strategies

Budzynski-Seymour, E., Milton, K., Mills, H., Wade, M., Foster, C., Vishnubala, D., Baxter, B., Williamson, C. and Steele, J.

Accepted author manuscript version reprinted, by permission, from Journal of Physical Activity and Health (JPAH), 2021 (ahead of print). © Human Kinetics, Inc.



A Rapid Review of Communication Strategies for Physical Activity Guidelines and Physical Activity Promotion: A Review of Worldwide Strategies.

Received: 16th Oct 2020
Supplementary Materials
<https://osf.io/wvz2a/>
For correspondence:
emily.budzynski-seymour@solent.ac.uk

Emily Budzynski-Seymour¹, Karen Milton², Hayley Mills³, Matthew Wade⁴, Charlie Foster⁵, Dane Vishnubala⁶, Beelin Baxter⁷, Chloë Williamson⁸, and James Steele^{1,4}

¹ Solent University

² University of East Anglia

³ Canterbury Christ Church University

⁴ ukactive Research Institute

⁵ University of Bristol

⁶ Hull York Medical School

⁷ Department of Health and Social Care in England

⁸ University of Edinburgh

Please cite as: E. Budzynski-Seymour., K. Milton., H. Mills., M. Wade., C. Foster., D. Vishnubala., B. Baxter., C. Williamson., and J. Steele (2020) A rapid review of communication strategies for physical activity guidelines and physical activity promotion: A review of worldwide strategies. SportRxiv. <https://doi.org/10.31236/osf.io/bhrky>

ABSTRACT

BACKGROUND: To support the strategy development for communication of the updated physical activity (PA) guidelines, the UK Chief Medical Officers' Expert Panel for Communication was created. **METHODS:** To help inform this process a rapid review was performed to identify and describe how other nations are communicating their PA guidelines and PA generally. Elements of the Health-enhancing physical activity (HEPA) policy audit tool (PAT) created by the World Health Organization (WHO) were used to investigate all 195 countries. **RESULTS:** Seventy-seven countries had their own guidelines, 53 used the WHO guidelines, and for 65 countries no guidelines could be found. For the communication, 27 countries used infographics, 56 had government policies/documents, and 11 used a

mass media campaign. Only 6 of these had been evaluated. Although many countries used infographics, there were no associated evaluations. As such any future communication strategies should incorporate an evaluation. Mass media campaigns had the strongest evidence base, proving to be an effective strategy, particularly when incorporating aspects of social marketing. CONCLUSION: This review provides an insight into strategies countries worldwide have taken to communicate PA guidelines and PA promotion. These should be carefully considered when deciding how best to communicate and promote PA guidelines.

INTRODUCTION

The health benefits of physical activity are well documented and include physiological and psychological outcomes [1,2,3]. The recent construction of national and global physical activity guidelines are testament to their public health impact [4,5]. These guidelines contain summary statements or recommendations, based on the latest evidence, that communicate the necessary amounts of physical activity required for specific and general health gains [6]. Communication theories posit that knowledge plays a part in influencing behaviour change, and further it has been suggested that the details of the recommendation presented in guidelines may be a contributing factor to whether or not people engage in the recommended levels of physical activity [7]. A person's physical activity may be influenced by physical activity recommendations via their communication and messaging [8]. Therefore, public awareness of the recommendations may help facilitate the process of achieving them; however successfully influencing the physical activity levels of a whole population requires the development of effective communication interventions, with the ability to reach a large audience [9]. It is worth noting that, while communication is a significant component in encouraging physical activity participation, in isolation it may not be enough to make the desired change. Nevertheless, understanding how physical activity guidelines are promoted (i.e. what strategies are utilised and their potential impact) is an important starting point for the development of communication interventions.

In the United Kingdom (UK) there are published guidelines for under 5's, young people, adults, older adults, those with a disability, pregnant women, and women after childbirth, which cover both aerobic physical activity and strength-based activity recommendations, and also advice on sedentary time [4, 10]. It has been noted that, at least in England, despite there having been a consistent and robust application of good scientific practices regarding guidelines and recommendations for physical activity, recently there has been a lack of sustainability to campaigns and communication to influence norms and behaviour [11]. Thus, with the launch of the latest physical activity guidelines there was an announcement that a specific expert panel for communication of the Chief Medical Officers' (CMOs) physical activity guidelines would be created. This is similar to Canada, who also followed the production of their 24-hour Movement Guidelines with the development of a Knowledge Translation subcommittee. These endeavours are important as without careful consideration of the approach to communication, there is a risk that the guidelines will fail to reach the intended audiences and end up being unused. There is a need for a coherent plan based upon the best available evidence as to how this important information is disseminated, and this is the aim of the Expert Panel for Communication – to develop a strategy for communicating the messages from the revised UK CMOs' guidelines on physical activity.

The UK is one of many countries with their own guidelines for physical activity. In all countries with guidelines there is a need to communicate them effectively to the various target audiences. Many countries may indeed have already employed communication strategies which could aid in informing the approach that the UK should take. One of the specific aims of the Expert Panel for Communication is to examine what is known not only about communication of physical activity guidelines, but also about the communication of physical activity messages for health more broadly [12]. Despite there being recent scoping reviews into both physical activity messaging [13] and physical activity guideline communication [14], to our knowledge no formal synthesis and description of worldwide national approaches to communicate physical activity guidelines or physical activity promotion has been undertaken. This knowledge would support the Expert Panel for Communication and help inform any future strategies on how the UK disseminates the new CMOs' physical activity guidelines. Therefore, the aim of this rapid review was to appraise all other countries with respect to whether they have physical activity guidelines (including a summary of their content), who they target, and how the guidelines and the promotion of physical activity more broadly are communicated, and the extent to which they had been evaluated and evidence of effectiveness been demonstrated. A summary of recommendations for practice will be provided at the end of this review.

METHOD

As this was a rapid review, the most time efficient method of collecting this data was needed [15]. Elements of the Health-enhancing physical activity (HEPA) policy audit tool (PAT) created by the WHO were used [16]. Using this tool, the most relevant sections to the present aim were completed for each country. These were:

1. Whether there were current physical activity / sedentary behaviour guidelines and who produced them – what is included in the guidelines?
2. Populations for delivery – who do the guidelines refer to?
3. How the guidelines/physical activity generally are communicated, their media, their settings, whether or not there has been a national communication strategy and if there are examples of this and/or evaluations of their effectiveness– how do they communicate the guidelines?

One-hundred and ninety-five countries were included in the review (all countries worldwide including the UK; current strategies used in the UK are presented) and the review used primarily grey literature i.e. materials and research produced by organisations outside of the traditional commercial or academic publishing and distribution channels. This approach was adopted mainly for expediency, as much of the required information is readily available on the individual countries government's website, or the WHO website. Researchers searched each countries government website and the WHO website first, before moving onto different sources of grey literature if needed. One reviewer (EBS) searched and identified all information and then a second reviewer (JS) did the same for a randomly generated sample of 20 countries (~10%). Any disagreements in identification of sources, data extraction, and results synthesis were discussed between the reviewers and then updates made to these 20 countries and other relevant countries (e.g. African countries including those not reviewed by JS were updated to note that they are listed on the WHO Regional Office for Africa website, and therefore utilise the WHO guidelines). Lastly, the existing knowledge of the members of the Expert Panel for Communication was utilised to include any sources that were knowingly missed in our searches.

RESULTS

Of the 195 countries reviewed, a total of 77 countries had their own guidelines with a further 53 countries adopting the WHO guidelines which includes 47 African countries that follow the WHO guidelines provided by the WHO Regional Office for Africa. Guidelines could not be found for 65 countries.

Overall, there were seven main subgroups of demographics found in the review, and thus these became the demographics used in this research (under 5's, young people, adults, older adults, pregnant/postpartum, those with chronic diseases and people with disability), with specific recommendations identified within the different physical activity guidelines. Only twelve countries included recommendations for all of these demographic groups; these were the USA, Sweden, Latvia, Germany, France, Italy, Greece, Croatia, Poland, Romania, Austria, and Finland. There were also four types of activities included in the physical activity recommendations (aerobic physical activity, muscle and bone strengthening, sleep and sedentary time) that were included within different countries guidelines, and only three countries included recommendations for all four types of activity; these were New Zealand, Australia, and Canada.

For the communication of either physical activity promotion, or physical activity guidelines, these were categorised into those countries that used infographics (n=27), had government policies/policy documents (n=56, of which 47 were the WHO Regional Office for Africa recommendations), and those that had previously employed a mass media campaign (n=11). Twelve countries used a combination of the above, and in total there were only 6 countries for which an evaluation of the effectiveness of these methods of communications were found. These included the UK, in addition to the USA, Australia, Canada, Finland, and Switzerland. The supplementary file (<https://osf.io/u8e29/>) provides links to all of the communication methods found for each country.

Table 1 illustrates the findings from each country for *who* the recommendations are for, *what* the recommendations are, and *how* they, along with physical activity more generally, were communicated.

Table 1: Summary of information

Country	POPULATION "who"							ACTIVITY "what"							Communication "how"			
	Under 5's	Young people	Adults	Elderly	Pregnant/postpartum	Disabled	Long term health conditions	WHO guidelines	Countries own guidelines	No guidelines found	Aerobic	Muscle and Bone	Sleep	Sedentary	Infographics	Policies/ Policy document	Mass Media Campaign	Evaluation of strategy
EUROPE																		
Russia		X	X					X			X	X		X				
Germany	X	X	X	X	X	X	X		X		X	X				X	X	
United Kingdom	X	X	X	X	X	X			X		X	X		X	X	X	X	X
France	X	X	X	X	X	X	X		X		X	X				X	X	
Italy	X	X	X	X	X	X	X		X		X							
Spain	X	X	X	X	X	X			X		X							
Ukraine										X								
Poland	X	X	X	X	X	X	X	X			X	X	X	X				
Romania	X	X	X	X	X	X	X	X			X	X	X	X				
Netherlands		X	X	X					X		X	X		X				
Czech Republic	X	X	X	X					X		X							
Greece	X	X	X	X	X	X	X		X		X							
Portugal										X								
Sweden	X	X	X	X	X	X	X		X		X	X		X		X		
Hungary	X	X	X						X		X	X						
Belarus										X								
Austria		X	X	X		X			X		X							
Serbia										X								
Switzerland		X	X	X					X		X				X	X		X
Bulgaria										X								
Denmark	X	X	X	X	X				X		X	X				X	X	
Finland	X	X	X	X	X	X	X		X		X	X		X		X	X	X
Slovakia		X	X	X					X		X							
Norway		X	X	X					X		X							
Ireland	X	X	X	X		X			X		X	X				X	X	
Croatia	X	X	X	X	X	X	X	X			X	X	X	X			X	

Moldova										X								
Bosnia and Herzegovinian			X						X		X							
Albania		X	X	X					X		X							
Lithuania		X	X	X	X				X		X						X	
North Macedonia										X								
Slovenia		X	X	X					X		X							
Latvia	X	X	X	X	X	X	X		X		X	X		X				
Estonia		X	X	X					X		X	X	X				X	
Montenegro										X								
Luxemburg	X	X	X	X	X		X		X		X							
Malta										X								
Iceland										X								
Andorra										X								
Monaco										X								
Liechtenstein										X								
San Marino										X								
Holy See										X								
<i>Percentage for continent</i>	<i>38.6%</i>	<i>61.4%</i>	<i>63.6%</i>	<i>56.8%</i>	<i>34.1%</i>	<i>31.2%</i>	<i>25%</i>	<i>9.1%</i>	<i>54.6%</i>	<i>34.1%</i>	<i>63.4%</i>	<i>34.1%</i>	<i>9.1%</i>	<i>20.4%</i>	<i>4.6%</i>	<i>22.7%</i>	<i>15.9%</i>	<i>6.8%</i>
NORTH AMERICA																		
United States of America	X	X	X	X	X	X	X		X		X	X			X	X	X	X
Mexico			X						X		X					X		
Canada	X	X	X	X	X	X			X		X	X	X	X	X		X	X
Guatemala		X	X	X					X		X				X			
Cuba									X		X							
Haiti										X								
Dominican Republic		X	X	X					X		X				X			
Honduras		X	X	X					X		X				X			
Nicaragua										X								
El Salvador		X	X	X					X		X				X			
Costa Rica		X	X	X					X		X							
Panama		X	X	X					X		X				X			
Jamaica	X	X	X	X					X		X	X			X			
Trinidad and Tobago		X	X	X					X		X	X		X				
Belize			X						X		X							
Bahamas		X	X	X					X		X				X			
Barbados		X	X	X					X		X				X			
Saint Lucia										X								
Grenada		X	X	X					X		X				X			
St Vincent and Grenadines		X	X	X					X		X				X			

Antigua and Barbuda		X	X	X					X		X				X			
Dominica		X	X	X					X		X				X			
Saint Kitts and Nevis		X	X	X					X		X				X			
<i>Percentage for continent</i>	12.5%	70.8%	79.2%	70.3%	8.3%	8.3%	4.2%	0%	83.3%	12.5%	83.3%	16.7%	4.2%	8.3%	62.5%	8.3%	8.3%	8.3%
SOUTH AMERICA																		
Brazil								X										
Columbia		X	X	X					X		X	X		X				
Argentina		X	X	X					X		X							
Peru			X						X		X							
Venezuela		X	X	X					X		X							
Chile		X	X	X					X		X			X				
Ecuador		X	X	X					X		X				X			
Bolivia										X								
Paraguay		X	X	X					X		X				X			
Uruguay			X						X		X			X				
Guyana		X	X	X					X		X				X			
Suriname										X								
<i>Percentage for continent</i>	0%	58.3%	75%	58.3%	0%	0%	0%	8.3%	75%	16.7%	75%	8.3%	0%	25%	25%	0%	0%	0%
ASIA																		
China								X										
India								X										
Indonesia	X	X	X	X					X		X							
Pakistan										X								
Bangladesh										X								
Japan			X	X					X		X							
Philippines		X	X	X					X		X	X		X				
Vietnam			X						X		X	X		X				
Turkey			X						X		X			X	X			
Iran										X								
Thailand										X								
Myanmar		X	X	X				X			X	X						
South Korea										X								
Iraq										X								
Afghanistan	X	X	X	X	X				X		X							
Saudi Arabia										X								
Uzbekistan										X								
Malaysia										X								
Yemen										X								
Nepal										X								
North Korea			X						X		X				X			

Sri Lanka		X	X	X	X				X		X	X		X				
Kazakhstan										X								
Syria										X								
Cambodia										X								
Jordan										X								
Azerbaijan										X								
United Arab Emirates										X								
Tajikistan										X								
Israel		X	X	X					X							X		
Laos								X			X							
Lebanon		X	X	X					X		X					X		
Kyrgyzstan										X								
Turkmenistan										X								
Singapore		X	X	X					X		X	X		X				
Oman										X								
State of Palestine										X								
Kuwait										X								
Georgia			X						X		X							
Mongolia									X									
Armenia										X								
Qatar	X	X	X	X			X		X		X	X		X				
Bahrain										X								
Timor-Leste										X								
Cyprus		X	X	X					X									
Bhutan										X								
Maldives		X	X	X				X										
Brunei		X	X	X	X				X									
<i>Percentage for continent</i>	<i>6.3%</i>	<i>25%</i>	<i>35.4%</i>	<i>27.1%</i>	<i>6.3%</i>	<i>0%</i>	<i>2.1%</i>	<i>10.4%</i>	<i>33.3%</i>	<i>56.3%</i>	<i>29.2%</i>	<i>12.5%</i>	<i>0%</i>	<i>12.5%</i>	<i>8.3%</i>	<i>0%</i>	<i>0%</i>	<i>0%</i>
OCEANIA																		
Australia	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X
Papua New Guinea										X								
New Zealand	X	X	X	X					X		X	X	X	X				
Fiji		X	X	X					X		X							
Solomon Islands			X						X		X							
Micronesia										X								
Vanuatu										X								
Samoa										X								
Kiribati										X								
Tonga										X								
Marshall Islands										X								

Palau										X								
Tuvalu										X								
Nauru										X								
Percentage for continent	14.3%	21.4%	28.6%	21.4%	7.1%	7.1%	7.1%	0%	28.6%	71.4%	28.6%	14.3%	14.3%	14.3%	7.1%	7.1%	7.1%	7.1%
AFRICA																		
Nigeria		X	X	X				X			X	X						
Ethiopia		X	X	X				X			X	X					X	
Egypt										X								
Democratic Republic of Congo		X	X	X				X			X	X					X	
United Republic of Tanzania		X	X	X				X			X	X					X	
South Africa		X	X	X				X			X			X	X	X	X	
Kenya	X	X	X	X					X		X	X					X	
Uganda			X					X			X						X	
Algeria		X	X	X				X			X	X					X	
Sudan										X								
Morocco										X								
Angola		X	X	X				X			X	X					X	
Mozambique		X	X	X				X			X	X					X	
Ghana		X	X	X	X	X	X		X		X	X						
Madagascar		X	X	X				X			X	X					X	
Cameroon		X	X	X				X			X	X					X	
Cote d'ivoire		X	X	X				X			X	X					X	
Niger		X	X	X				X			X	X					X	
Burkina Fasco		X	X	X	X			X			X	X					X	
Mali		X	X	X				X			X	X					X	
Malawi		X	X	X				X			X	X					X	
Zambia		X	X	X				X			X	X					X	
Senegal		X	X	X				X			X	X					X	
Chad		X	X	X				X			X	X					X	
Somalia										X								
Zimbabwe		X	X	X				X			X	X					X	
Guinea		X	X	X				X			X	X					X	
Rwanda		X	X	X				X			X	X					X	
Benin		X	X	X				X			X	X					X	
Burundi		X	X	X				X			X	X					X	
Tunisia										X								
South Sudan		X	X	X				X			X	X					X	
Togo		X	X	X				X			X	X					X	
Sierra Leone			X						X		X				X			
Libya										X								
Congo		X	X	X				X			X	X					X	
Liberia		X	X	X				X			X	X					X	

Central African Republic		X	X	X		X		X			X	X				X		
Mauritania		X	X	X				X			X	X				X		
Eritrea		X	X	X				X			X	X				X		
Namibia		X	X	X				X			X	X				X		
Gambia		X	X	X				X			X	X				X		
Botswana		X	X	X				X			X	X				X		
Gabon		X	X	X				X			X	X				X		
Lesotho		X	X	X				X			X	X				X		
Guinea-Bissau		X	X	X				X			X	X				X		
Equatorial Guinea		X	X	X				X			X	X				X		
Mauritius		X	X	X				X			X	X				X		
Eswatini		X	X	X				X			X	X				X		
Djibouti										X								
Comoros		X	X	X				X			X	X				X		
Cabo Verde		X	X	X				X			X	X				X		
Sao Tome and Principe		X	X	X				X			X	X				X		
Seychelles		X	X	X				X			X	X				X		
<i>Percentage for continent</i>	<i>1.9%</i>	<i>83.3%</i>	<i>87%</i>	<i>38.3%</i>	<i>3.7%</i>	<i>3.7%</i>	<i>1.9%</i>	<i>81.5%</i>	<i>5.6%</i>	<i>13%</i>	<i>87%</i>	<i>81.5%</i>	<i>0%</i>	<i>1.9%</i>	<i>3.7%</i>	<i>81.5%</i>	<i>0%</i>	<i>0%</i>

DISCUSSION

Overview of principle findings

This rapid review found that a majority of countries have explicit guidelines for physical activity, although many rely on those of the WHO, with only ~39% of countries having developed their own. This is similar to the proportions reported in European countries by Kahlmeier et al. (2015) [17]. In the current review only eight countries had specific recommendations for all demographic groups (the 7 groups as reported in the results section). Further, the content of guidelines varied across countries and only three countries included all four activity types in their recommendations (the 4 types as reported in the results section).

Seventy-nine countries promoted the guidelines or physical activity generally in some way; though most (n=47) of these came from the default use of the WHO's materials through the WHO Regional Office for Africa. The most popular media for communication was through government policy documents (n=56), then using infographics (n=27), and finally mass media campaigns (n=11). Thus, it can be stated that relatively few countries engaged in their own communications approaches for the guidelines, or in physical activity promotion, and for the minority that did there was a relative lack of evidence regarding evaluation of the effectiveness of their implemented strategies and approaches; evaluations were identified for only 3% of countries that used a communication approach. We suggest that any future

communication strategies should consider early development and embedding of methods for evaluating their effectiveness, and ideally prior to their implementation. Despite the general lack of direct evidence for effectiveness, some approaches appeared to be fairly consistently implemented suggesting at least a *perceived* effectiveness by policy makers internationally. Thus, we discuss these with reference to wider evidence and speculate upon insights they may provide into potentially effective communication strategies.

Types of physical activity guidelines – daily vs weekly messages?

As noted, guidelines existed for all four types of activity (aerobic, muscle and bone, sleep and sedentary) for only three countries, and these were presented in the form of 24-hour guidelines. The approach taken by these countries is not to recommend what people should be doing with some of their time across the week; but rather they recommend how people should use all of their time by splitting up the whole day. An example of this is the Canadian 24-Hour Movement Guidelines for Children and Youth which is an integration of physical activity, sedentary behaviour, and sleep [18]. They provide specific recommendations on the amount of time over a typical 24-hour day that children and youth aged 5 to 17 should spend in moderate-to-vigorous physical activity (at least 60 minutes), recreational screen time (no more than 2 hours), and sleep (9 to 11 hours for 5- to 13-year-olds; 8 to 10 hours for 14- to 17-year-olds). Australia and New Zealand also adopt this approach for some of their guidelines [19, 20]. Not only does it outline the minimum levels of physical activity required to gain health benefits but it also incorporates these into the wider context of everyday life – potentially enabling individuals to better understand how to fit these various recommendations into their lives. It could be said that adopting a 24-hour approach, similar to that of Canada, is a more holistic way of promoting physical activity and a healthier lifestyle as it shows the relationship between the different aspects needed to make up the day. There has been consideration by experts in the UK regarding adopting a 24-hour approach and this could represent a positive step towards more effective communication of the physical activity guidelines.

Communication – to who?

This review of the countries revealed a number of specific methods currently being employed to either disseminate physical activity guidelines, or more generally to promote physical activity. Interestingly there are variations in the aims of different countries' guidelines, and which specific population group they target. Table 2 shows the aims of the guidelines that were found for those countries that both had guidelines and included their aims (links to each countries guidelines and communication approaches can be found in the supplementary material). This table clearly highlights that these guidelines are focused at health professionals and that they are expected to "take over" at this stage. For example, the Finish aim is "to encourage local authorities to make physical activity a strategic choice", similar to in Sweden where their aim is focused towards "all who work in promoting physical activity". This may suggest that the focus is on communicating the guidelines to stakeholders and health professionals, and that separate communication strategies need to come at a later stage, when these stakeholder then use the information to communicate physical activity more generally to the public.

Table 2: Example aims

Country	Guidelines Aim
Finland	Aim to encourage local authorities to make physical activity a strategic choice
Germany	Aimed at the whole professional stakeholders and organizations in the fields of physical activity promotion.
Ireland	Useful to everyone involved in promoting health and physical activity in Ireland
Sweden	All who work in promoting physical activity, but also as a textbook for various educational programs
UK	Guidance to help health professionals, policy makers and others working to promote physical activity, sport and exercise for health benefits
USA	An essential resource for health professionals and policy makers

This point also raises a key differentiation that needs to be acknowledged - the difference between the promotion of the guidelines (i.e., presenting and communicating the knowledge of what needs to be done), and the promotion of the action required (i.e., promoting ways to be physically active). Perhaps the guidelines need not to be promoted as such (at least not to the general public), but only communicated to the health professionals. It is at this point that separate communication strategies come into play, when health professionals and other stakeholders use them as a guiding tool to promote physical activity to the general population.

This approach can be seen in the US dissemination of the guidelines and physical activity promotion. In the US they have provided separate communication to their health professionals and for the general public. These were done in different formats; a policy document was created for the health professionals and a social marketing campaign was developed for the public. This shows how the information was presented and outlined to the health professionals and stakeholders, and then they translated it for the general public. Their campaign Move Your Way was developed to share key recommendations from the guidelines to the public to spread the word; this was done through factsheets, videos, posters, interactive tools, web badges, and widgets [21]. Figure 1 illustrates one of these factsheets which was created specifically for children and presents the information through infographics in a child friendly manner. Although the information presented to the general public does include the need to complete 60 minutes of physical activity every day (this particular infographic is aimed at children), the main emphasis is on providing information on the benefits of engaging in physical activity, and suggestions on ways in which to meet the guidelines e.g., walking to school and playing at play time.

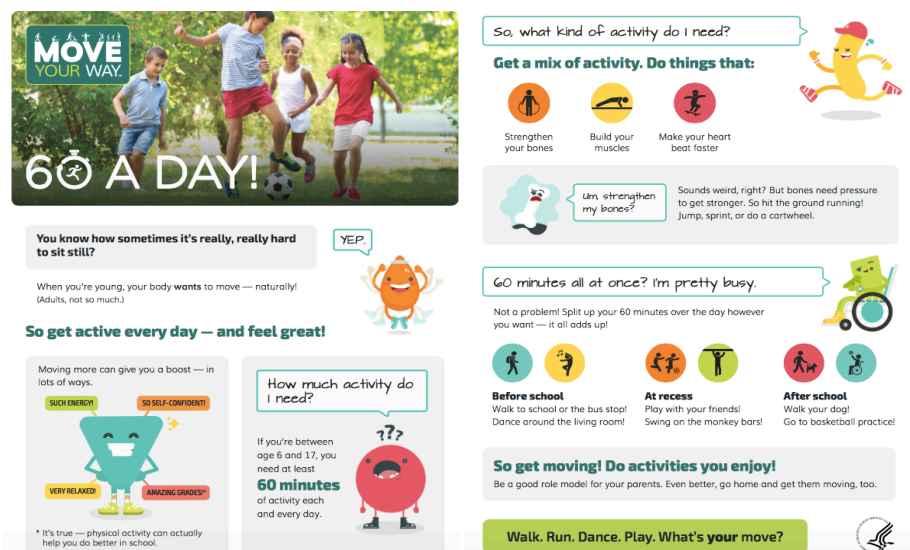


Figure 1: USA Move Your Way Campaign

This however could represent a point where the communication approach needs improvement, a recent review on physical activity messaging highlighted the key attributes of messages for each target population [13]. For children it was said that the emphasis needs to be on positively framing it, including messages such as “physical activity is fun”. As such, the US infographic emphasizing the benefits and examples may not be the best approach for this particular target audience.

Communication guidelines for stakeholders/health professionals

As seen in table 2, many countries state their aims are focused at providing health professionals and stakeholders the key information, for them to communicate to the general public. However very few of these guidelines are accompanied with support on how to do this; clear communication strategies to accompany the publication of physical activity guidelines has not been usual practice [22]. However, a limited number of studies have published guidelines on how to promote physical activity alongside their physical activity guidelines. This suggests, as the emphasis here is on promoting physical activity rather than the guidelines, that many countries feel that it is the role of the health professionals and stakeholders to use the information provided to promote physical activity more generally to the population, rather than have a focus on promoting the specific guidelines.

This can be seen in Switzerland’s policy document where alongside their physical activity guidelines they also provide some *guiding principles* for physical activity promotion. These include promoting physical activity as an easy choice, addressing different determinants of physical activity, providing resources for physical activity, and being evidence based [23]. This was similar to what was suggested in Norway’s physical activity communication guidelines in their action plan on physical activity which states that it is important to emphasise that being physically active may in fact be extremely simple, and that little effort is required to obtain positive health benefits [24]. In the Irish physical activity promotion this was again the case, with key messages being provided for physical promotion, these being to stress the benefits, promote self-belief, promote social support and suggest ways to fit physical activity into daily

life [25].

In the German policy documentation, there was an importance given to an evidence-based approach, which was the first of four criteria for developing and structuring the recommendations. These were: 1) scientific proof of the effectiveness of the intervention, 2) effectiveness in terms of promoting public health, 3) being cost effective, and 4) the quality of the design, implementation, and evaluation [26]. In their policy document it is stated that the active involvement of stakeholders and organizations from the respective contexts is fundamental for the dissemination of the guidelines and for them reaching the target audiences. This perhaps is the only communication strategy that accompanied the countries guidelines that focused on the communication of the guidelines, as opposed to physical activity more generally. However, they did also include in the document that mass media campaigns are an effective way of promoting physical activity, in addition to point of decision prompts, and targeting environmental approaches (e.g. geographical proximity, traffic calming, sport and leisure facilities, and infrastructure for promoting cycling and walking). This again supports the notion that communication approaches need to be employed both to the stakeholders and health professionals, and to the general public. For the latter, the emphasis is not on communicating the guidelines directly, but on the health professionals and stakeholders communicating the messages included in these guidelines to the general public. Policy documents can communicate the specific physical activity guidelines messages to the stakeholders and health professionals, at which point they communicate specific physical activity messages to the general public, which align to these guidelines.

Using infographics as a communication approach

One way in which the information can be communicated from the stakeholders and health professionals to the general public is through infographics; indeed, based on this review infographics are a popular approach to illustrate the information. A clear example of this can be seen in figure 2 which presents the physical activity recommendations from Switzerland's guidelines [23]. Infographics are an effective way to present complex data in a visual format that is compelling, provides rapidly available information, and is directly useful for decision-making purposes [27]. Indeed, in the UK they have often been developed with supporting formative research [28,29]. As figure 2 illustrates they can also have a cultural emphasis; in the Swiss policy document it states that Switzerland has a very favorable environment and offers many traditional activities including physical activity, exercise, and sport [23]. These include hiking and walking; hence the inclusion of suitable footwear for these activities in the infographics. Similar to the brochures and factsheets presented by Australia and the USA, it also includes both the necessary information on how much physical activity is needed, and recommendations on how to meet the guidelines. These again are also specific to each population, for example the inclusion of skipping and skateboarding in the children's infographic, and skiing and walking in the adults and older adults infographic.



Figure 2: Switzerland's Infographics

Twenty-two countries using infographics interestingly included both the nutritional and physical activity guidelines. Although this review is primarily considering communication of physical activity guidelines, there are some important feature of these figures that are worth noting. Firstly, similar to the Swiss infographics, there are a number of cultural references in displaying the information, including native instruments as seen in the Bahamas infographic shown in Figure 3 [30]. This is a theme that runs throughout many countries' presentation of infographics and at the least suggests there is a perceived effectiveness in this approach by communications strategists in these countries; although the limited evidence that has tested the use of culturally sensitive frames for physical activity have not supported its effectiveness [31]. Furthermore, it suggests the inclusion of physical activity with nutrition messages may reflect their national priorities for obesity. Similar to the Swiss infographic of the physical activity guidelines, numerous infographics here include examples of *how* to complete the recommendations. Figure 4 is the infographic from Guyana; it depicts a bowl, and while the inside is demonstrating nutritional recommendations the outside of the bowl depicts many ways in which people can be active, including swimming and walking [32]. Again, all include suggestions of how to meet the recommendations, demonstrating how infographics are not limited to only presenting the guidelines themselves but can also include suggestions and act towards wider physical activity promotion. It may be prudent to use physical activity message communication research here to guide what and how gets communicated via this method [13]. This would at least provide a theoretical base for the information incorporated, even if there still is a lack of research on the communication method. As there is currently a lack of evaluations of the effectiveness of infographics as a behaviour change strategy, we further stress the need to incorporate an evaluation into the implementation of any new communication strategy.

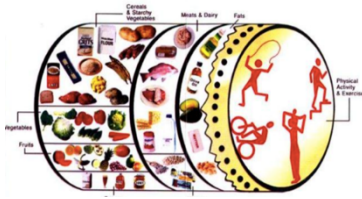


Figure 3: Bahama's infographics

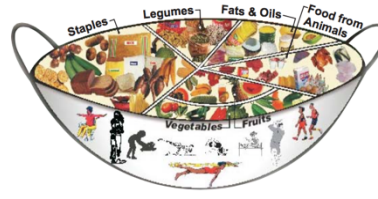


Figure 4: Guyana's infographics

The infographics that are currently being used in the UK were developed for use by healthcare professionals and the intention was for them to *display* these in healthcare settings and to communicate their messages to patients. Indeed, in the UK the CMOs' physical activity guidelines are actually intended for "professionals, practitioners, and policymakers"; in fact, this was part of the rationale for forming the Expert Panel for Communication and to consider communication of their messages to wider public audiences. As explained above, the USA also state that their guidelines were written for professionals and not a public audience; that they need to be *translated* into actionable customer messages to help people achieve the recommendations. This is why their Move Your Way campaign was created, to communicate the recommendations in plain language, to promote the health benefits and provide helpful tips. This is an example of a mass media campaign.

Using mass media campaigns as a communication approach

A further communication approach that stakeholders and health professionals could adopt is that of a mass media campaign. In this review there were 11 countries that adopted mass media campaigns to communicate either the physical activity guidelines, or physical activity more generally. These campaigns are widely used to expose high proportions of large populations to messages through routine uses of existing media, such as television, radio, and newspapers [33]. An example was Canada's participACTION, which was one of the few communication strategies that has been evaluated [31]. When the campaign was relaunched in 2007 one focus was to inform parents of elementary school children about the risks of physical inactivity for children and youth [31]. To assess the effectiveness, they measured awareness of campaign messages; a quarter of responders showed unprompted awareness, and promoted awareness was 57%, and indeed awareness was associated with leisure-time physical activity [34]. In an evaluation of the Australian "Find your 30 every day" mass media campaign, awareness was one of three outcome variables used, in addition to intention to partake in physical activity and actual levels of physical activity [35]. They implemented cross sectional surveys pre and post a two-year intervention period and reported that all three measures had been positively impacted by the mass media campaign. Another intervention that has been successful is the American VERB™ campaign which was launched in 2002 and used social marketing principles in an effort to increase the physical activity levels of children aged 9 to 13 years old [36]. The intention behind the campaign was to become the children's brand for physical activity, effecting behavioural norms by positioning physical activity as a highly appealing and easy choice [36]. Survey based evaluations of VERB™ found it to be successful in its initial launch at increasing awareness [37] which was sustained up to 2 years after [37, 38], and appeared to positively influence children's physical activity behaviours over this period [37, 38]. Indeed, its success has led to exploration of its adaptation for wider diverse audiences [39].

Not only do these evaluations demonstrate the positive impact that mass media campaigns can have on physical activity, they also illustrate a number of methods that can be employed to evaluate the intervention. However as noted, the majority of approaches implemented by countries are lacking in direct evaluation of their success. The UK does have its own social marketing campaign, Change4Life, which was established in 2009 as part of a national ambition set out in the governments healthy weight, healthy lives plan [40], in addition to those aimed at specific groups such as This Girl Can and We Are Undefeatable [41, 42]. Considering the apparent success of campaigns in other countries, social marketing campaigns employed through mass media seem to be an effective way to promote physical activity guidelines and promote physical activity more generally due to their ability to reach a large audience.

Although some evidence suggests these UK campaigns are effective at raising awareness [43], research investigating their impact upon knowledge and physical activity behaviours is less promising [44]. Linking back to the German recommendations it is important to design and embed the evaluation of any strategies prior to their implementation, and methods of evaluating a strategy needs to be careful considered.

Summary of recommendations for practice

- Infographics are a popular way to display the information despite the lack of evidence to support their effects on behaviour change. However, if implemented and evaluated they may be an effective way to display both how much physical activity is needed and how to meet these guidelines. Furthermore, incorporating culturally appropriate imagery and colours is also a popular strategy to include with this type of communication; though this also requires further evaluation.
- There is a decision to make between what specifically to communicate; the physical activity guidelines or physical activity more generally. The research suggests that promotion of both is common and perhaps this will be more effective than one alone. However, this also requires empirical evaluation.
- The information given to stakeholders likely needs to be different to that given to the general public. If the stakeholders are targeted then they need to translate the guidelines into a more public friendly communication method.
- Any new communication strategies should have a method of evaluation built in, and before any new communication strategies are implemented. These should be tailored to the specific outcomes which the strategies are aimed at and will likely include awareness, knowledge, intentions, and behaviours.
- Consider the benefits of mass media, specifically those that employ social marketing strategies as these stand out as the only approaches that have been previously evaluated and can be said to be beneficial in leading to behaviour change.

CONCLUSION

Improving our understanding of how to best communicate physical activity guidelines may play a role in improving population physical activity levels. This review provides a summary of physical activity communication approaches across 195 countries, for both physical activity guidelines and physical activity promotion. We also provide recommendations for new communication strategies, building on and supporting many of the examples included in this review. Though there are consistencies in many of

the approaches taken between countries suggesting a perceived consensus on what is effective, there is a general lack of evaluation of specific approaches upon key outcomes including awareness, knowledge, intentions, and behaviours. For example, though infographics are popular their effectiveness for influencing physical activity behaviour change has not been evaluated. Also, though it seems intuitive that approaches such as physical activity guidelines using the 24hr approach might inherently support their ease of communication, or culturally sensitive framing to help deliver the message, more research is needed to understand whether these approaches are effective. Approaches with the strongest evidence appear to be those mass media campaigns, some of which adopt social marketing principles. Social marketing strategies in particular should be employed due to their ability to reach and engage a large target audience. It also clear that these broad methods can be employed successfully for different audiences (e.g. children and adults) with tailoring of delivery (e.g. Budzynski-Seymour et al., 2020 [45]) There is evidence from countries around the world that social marketing strategies and mass media campaigns can be an effective strategy, and these are at least being employed within the UK. However, in relation to those previously and currently used in the UK, evaluation is needed to directly ascertain their effectiveness, strengths, and weaknesses as this is an area currently lacking in research.

Also, there is a need to decide whether it is better to promote the physical activity guidelines themselves or physical activity more generally. Do people need to know how much physical activity they need to be doing, or do they just need to be prompted to be physically activity along with knowledge of how to do so? Perhaps both combined is the optimal approach to facilitate wide scale behaviour change. Whatever is ultimately chosen, we argue that any newly developed and implemented communications strategies should consider a priori the design and embedding of appropriate evaluation strategies for the intended primary outcomes of these approaches; in particular identifying ahead of implementation what would be deemed 'success' (e.g. how much of a change in awareness, knowledge, intentions, or behaviours would be considered to be enough to matter). Considering the current lack of evaluation of effectiveness for many approaches identified in this rapid review, we view this as a fundamental requirement and obligation for policy makers. Finally, it is key to identify and consider the target audience of the communicated message, the communication needs to be tailored carefully to appropriately meet each target groups needs for optimal delivery.

DATA AND SUPPLEMENTARY MATERIAL ACCESSIBILITY

Supplementary files are available at the project page on the Open Science Framework:
<https://osf.io/wvz2a/>

REFERENCES

1. Hills, A. P., Dengel, D. R., & Lubans, D. R. (2015). Supporting public health priorities: recommendations for physical education and physical activity promotion in schools. *Progress in cardiovascular diseases*, 57(4), 368-374.
2. Biddle, S. J., & Asare, M. (2011). Physical activity and mental health in children and adolescents: a review of reviews. *British journal of sports medicine*, 45(11), 886-895.
3. US Department of Health and Human Services. (2018). Physical activity guidelines advisory committee scientific report. Washington (DC): US Department of Health and Human Services.
4. UK Chief Medical Officers Physical Activity Guidelines (2019) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf
5. Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., ... & Dempsey, P. C. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, 54(24), 1451-1462.
6. Oja, P., Bull, F. C., Fogelholm, M., & Martin, B. W. (2010). Physical activity recommendations for health: what should Europe do?. *BMC Public Health*, 10(1), 1-5.
7. Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., ... & Bauman, A. (2007). Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine & science in sports & exercise*, 39(8), 1423-1434.
8. Segar, M., Taber, J. M., Patrick, H., Thai, C. L., & Oh, A. (2017). Rethinking physical activity communication: using focus groups to understand women's goals, values, and beliefs to improve public health. *BMC public health*, 17(1), 462.
9. Marcus, B., Owen, N., Forsyth, L., Cavill, N., & Fridinger, F. (1998). Physical activity interventions using mass media, print media, and information technology. *American journal of preventive medicine*, 15(4), 362-378.
10. Public Health England (2020) Health Matters: Physical activity prevention and management of long term conditions <https://www.gov.uk/government/publications/health-matters-physical-activity/health-matters-physical-activity-prevention-and-management-of-long-term-conditions>
11. Milton, K., & Bauman, A. (2015). A critical analysis of the cycles of physical activity policy in England. *International journal of behavioral nutrition and physical activity*, 12(1), 1-9.
12. University of Bristol, (2019). UK Physical Activity Expert Committee for Communications. <http://www.bristol.ac.uk/media-library/sites/sps/documents/cmo/Expert%20Committee%20for%20Communications%20-%20outline.pdf>
13. Williamson, C., Baker, G., Mutrie, N., Niven, A., & Kelly, P. (2020). Get the message? A scoping review of physical activity messaging. *International Journal of Behavioral Nutrition and Physical Activity*, 17, 1-15.
14. Bergeron, C. D., Tanner, A. H., Friedman, D. B., Zheng, Y., Schrock, C. S., Bornstein, D. B., ... & Swift, N. (2019). Physical activity communication: a scoping review of the literature. *Health promotion practice*, 20(3), 344-353.
15. World Health Organization, Alliance for Health Policy and Systems Research (2017)

<https://www.who.int/alliance-hpsr/resources/publications/rapid-review-guide/en/>

16. World Health Organisation, Health-enhancing physical activity (HEPA) policy audit tool (PAT) - version 2 (2015) <http://www.euro.who.int/en/health-topics/disease-prevention/physical-activity/publications/2015/health-enhancing-physical-activity-hepa-policy-audit-tool-pat-version-2-2015>
17. Kahlmeier, S., Wijnhoven, T. M., Alpiger, P., Schweizer, C., Breda, J., & Martin, B. W. (2015). National physical activity recommendations: systematic overview and analysis of the situation in European countries. *BMC public health*, 15(1), 133.
18. Tremblay, M. S., Carson, V., Chaput, J. P., Connor Gorber, S., Dinh, T., Duggan, M., ... & Janssen, I. (2016). Canadian 24-hour movement guidelines for children and youth: an integration of physical activity, sedentary behaviour, and sleep. *Applied Physiology, Nutrition, and Metabolism*, 41(6), S311-S327.
19. Australian Government Department of Health, 2019. Australia's Physical Activity and Sedentary Behaviour Guidelines and the Australian 24-Hour Movement Guidelines <https://www1.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-strateg-phys-act-guidelines>
20. Ministry of Health – Manatū Hauora, physical activity (2017) <https://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity>
21. Move your way campaign (2020) <https://health.gov/our-work/physical-activity/move-your-way-campaign>
22. Milton, K., Bauman, A. E., Faulkner, G., Hastings, G., Bellew, W., Williamson, C., & Kelly, P. (2020). Maximising the impact of global and national physical activity guidelines: the critical role of communication strategies. *British Journal of Sports Medicine*, 54(24), 1463-1467.
23. Health-Enhancing Physical Activity Core Document for Switzerland (2013) https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUK EwiPpufypLbrAhXxweYKHb1rDAoQFJAaegQIBhAB&url=https%3A%2F%2Fwww.hepa.ch%2Fcontent%2Fhepa-internet%2Fde%2Fbewegungsempfehlungen%2F_jcr_content%2FcontentPar%2Faccordion_1163474913%2FaccordionItems%2Fdokumente_in_englisc%2FaccordionPar%2Fdownloadlist_copy%2FdownloadItems%2F130_1482330975168.download%2Fhepa_Gesundheitswirksame%2520Bewegung_Grundlagendok_EN.pdf&usq=AOvVaw1wCN80HottbEWx6jOJKQCh
24. Working together for physical activity (2005) https://www.regjeringen.no/globalassets/upload/kilde/hod/red/2006/0002/ddd/pdfv/269037-hod_kortversjon_engelsk.pdf
25. The National Guidelines on Physical Activity for Ireland (2009)(<https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/heal/heal-docs/the-national-guidelines-on-physical-activity-for-ireland.pdf>)
26. Rütten, A., Pfeifer, K., Banzer, W., Ferrari, N., Füzéki, E., Geidl, W., ... & Vogt, L. (2016). National recommendations for physical activity and physical activity promotion.
27. Otten, J. J., Cheng, K., & Drewnowski, A. (2015). Infographics and public policy: using data visualization to convey complex information. *Health Affairs*, 34(11), 1901-1907.
28. Reid, H., Milton, K., Bownes, G., & Foster, C. (2017). Making physical activity evidence accessible: are these infographics the answer?
29. Smith, R., Shakespeare, J., Williams, Z., Knight, M., & Foster, C. (2017). Physical activity for pregnant women: an infographic for healthcare professionals. *The British Journal of General Practice*, 67(663),

460.

30. Food and Agriculture recommendations for the United Nations, Food-based dietary guidelines – Bahamas (2020), <http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/countries/Bahamas/en>
31. Spence, J. C., Brawley, L. R., Craig, C. L., Plotnikoff, R. C., Tremblay, M. S., Bauman, A., ... & Clark, M. I. (2009). ParticipACTION: Awareness of the participACTION campaign among Canadian adults- Examining the knowledge gap hypothesis and a hierarchy-of-effects model. *International Journal of Behavioral Nutrition and Physical Activity*, 6(1), 1-9.
32. Food and Agriculture recommendations for the United Nations, Food-based dietary guidelines – Guyana (2020), <http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/countries/Guyana/en>
33. Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet*, 376(9748), 1261-1271.
34. Craig, C. L., Bauman, A., Gauvin, L., Robertson, J., & Murumets, K. (2009). ParticipACTION: A mass media campaign targeting parents of inactive children; knowledge, saliency, and trialing behaviours. *International Journal of Behavioral Nutrition and Physical Activity*, 6(1), 88.
35. Leavy, J. E., Rosenberg, M., Bauman, A. E., Bull, F. C., Giles-Corti, B., Shilton, T., ... & Barnes, R. (2013). Effects of find thirty every day®: cross-sectional findings from a western Australian population-wide mass media campaign, 2008-2010. *Health education & behavior*, 40(4), 480-492.
36. Huhman, M., Potter, L. D., Wong, F. L., Banspach, S. W., Duke, J. C., & Heitzler, C. D. (2005). Effects of a mass media campaign to increase physical activity among children: year-1 results of the VERB campaign. *Pediatrics*, 116(2), e277-e284, *Human Behavior*, 72, 381-389.
37. Huhman, M. E., Potter, L. D., Duke, J. C., Judkins, D. R., Heitzler, C. D., & Wong, F. L. (2007). Evaluation of a national physical activity intervention for children: VERB™ campaign, 2002–2004. *American Journal of Preventive Medicine*, 32(1), 38-43.
38. Huhman, M., Bauman, A., & Bowles, H. R. (2008). Initial outcomes of the VERB™ campaign: tweens' awareness and understanding of campaign messages. *American Journal of Preventive Medicine*, 34(6), S241-S248.
39. Colquitt, G., Walker, A., & Alfonso, M. (2014). Adapting a Community-Based Physical Activity Promotion Program for Rural, Diverse Youth. *Physical Educator*, 71(3), 514.
40. Change4Life (2020) <https://www.nhs.uk/change4life>
41. This Girl Can (2020) <https://www.thisgirlcan.co.uk>
42. We are undefeatable (2020) <https://www.weareundefeatable.co.uk>
43. Mulgrew, K. E., McCulloch, K., Farren, E., Prichard, I., & Lim, M. S. (2018). This girl can# jointthemovement: Effectiveness of physical functionality-focused campaigns for women's body satisfaction and exercise intent. *Body image*, 24, 26-35
44. Hillsdon, Melvyn, N. Cavill, K. Nanchahal, A. Diamond, and I. R. White. "National level promotion of physical activity: results from England's ACTIVE for LIFE campaign." *Journal of Epidemiology & Community Health* 55, no. 10 (2001): 755-761.
45. Budzynski-Seymour, E., Turvey, S., Paterson, J., Jones, M., & Steele, J. (2019, September 24). The Two Converging Paths of Social Marketing and Behavioural Economics: A Systematic Review and Narrative Synthesis of Their Effect on Physical Activity and Nutrition Behaviours in Children. <https://doi.org/10.31234/osf.io/kh37d>

