




# **Training Current and Future Health-related Practitioners to Accurately and Appropriately Disseminate Physical Activity Guidelines**

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## **Abstract**

Current and future health-related practitioners have low awareness of physical activity guidelines (PAGs) for general and clinical populations. The purpose of the present study was to critically appraise the quality of one 2021 draft training video, which was designed to help current and future health-related practitioners give advice consistent with general adult PAGs. A descriptive qualitative analysis was performed on open-ended responses provided by undergraduate research assistants (or recent alumni) affiliated with the first author's lab and uninvolved in the video's creation. Participation was optional, anonymous, and through an online questionnaire, open for seven days in April 2021 (14 invited, 8 participated, response rate = 57.14%). Participant feedback was compared to applicable standards of the RE-AIM framework (i.e., reach, efficacy, and adoption). Face validity and other quality measures were determined through qualitative analysis. The first author performed the descriptive analysis, and the second author, acting as a critical friend, independently verified the trustworthiness of the analysis. No issues were identified (i.e., a succinct and veracious analysis). Participants generally agreed the draft video was clear, concise, informative, and interesting. Participants did not perceive any major concerns with the video (e.g., non-offensive/biased), and their suggestions were used to finalize the training video (e.g., to add closed captioning, further explain a graph). Results confirmed the video had good face validity and could be effective within real-world educational settings for current and future health-related practitioners (e.g., low time burden, stimulating, informative). Future research should investigate learning outcomes of the video and its real-world implementation.

**Keywords:** Exercise science, kinesiology, knowledge translation, health communication, physical activity promotion guidelines, RE-AIM

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## **1 Introduction**

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While current and future health-related practitioners should be better trained in using health behavior theory to counsel patients/clients and to plan services (Thomas & Cardinal, 2021), another looming issue concerns their ability to accurately and appropriately disseminate physical activity guidelines (PAGs, i.e., the frequency, intensity, duration, and type of activities encouraged for health-related fitness and psychological well-

being; U.S. Department of Health & Human Services, 2018; World Health Organization, 2020). Most health-related practitioners and college majors may lack PAG-awareness or precise knowledge of the guidelines (Cardinal et al., 2015; Vermeesch et al., 2020; Zenko & Ekkekakis, 2015). For example, Zenko and Ekkekakis (2015) used an 11-item multiple-choice test to assess practical knowledge of aerobic PAGs in a large and diverse sample of students and professionals. The mean score for the number of correct answers was 42.87% (95% CI = 42.08-43.65%). While job type

and educational attainment were positively associated with mean test scores, the 95% confidence interval of subgroups with scores above the sample average did not exceed 55% and ranged from 44.15% to 52.28%<sup>1</sup>. Another interesting finding from the Zenko and Ekkekakis study was that self-confidence in answer choice and perceived knowledge gaps lacked substantial association with test scores (i.e., mean scores were largely equivalent), which suggests two implications. First, professionals designing physical activity promotion material or counseling clients in exercise may overestimate their mastery of PAGs (Barton et al., 2021; Thomas et al., 2022b). Second, even if professionals recognize they have a knowledge gap, they may lack resources or understanding of how to close their knowledge gaps (Cardinal et al., 2015; Carter-Roberts et al., 2021). Despite a PAG knowledge gap, health-related practitioners may still counsel patients/clients about physical activity such as asking about physical activity and encouraging exercise (Barton et al., 2021; Das et al., 2018). For example, 87% of participants in Das et al.'s (2018) study of 30 health and medical professionals reported offering clients/patients advice about physical activity, despite only 7% self-reporting exact PAG-knowledge. Barton et al.'s (2021) multinational survey of physiotherapists (a.k.a., physical therapists) suggests that most physical activity counseling by providers/practitioners, however, may be in the form of exercise instruction to recover from an injury or manage a health condition, rather than framed as a lifestyle goal to pursue (e.g., something to work towards or keep-up after recovery). A much larger portion of participants from their study felt confident in their ability to deliver aerobic and resistance training interventions (e.g., 45-58%) than those who stated they used specific PAGs in their routine practice (e.g., 16-24%; Barton et al., 2021). Within that same sample, "37% correctly stated older adults should accumulate 150 minutes of moderate or 75 minutes of vigorous physical activity per week" and "68% correctly stated adults should complete strength training involving major muscle groups at least twice per week" (Barton et al., 2021, p. 100). To address these sort of issues (e.g., low PAG-knowledge, overconfidence in PAG-knowledge, low PAG application), continuing education workshops have focused on the following goals: (a) providing practitioners with resources, techniques, and perspectives to effectively promote physical activity

<sup>1</sup>A confidence interval estimates how a mean value observed in a sample may vary (i.e., the range; Simundic, 2008).

(O'Brien et al., 2017) and (b) training practitioners in ways to give PAG-consistent advice (Calle et al., 2016). There remains a need to ensure that health-related practitioners convey PAGs accurately and appropriately. While continuing education workshops may enhance knowledge of some PAGs and motivation to counsel patients on physical activity, that is not always a consistent outcome (Wattanapisit et al., 2018). Moreover, the issue of inappropriate PAG communication may receive little attention. Thomas and Cardinal (2020) analyzed web articles developed by professional associations and other groups, and they found that messages consistent with PAGs for sedentary adults were the least disseminated. At least 25% of the US adult population engages in no leisure time physical activity (An et al., 2016), and at least half are active but less than the PAG recommendations to accumulate 150 minutes of moderate, or 75 minutes of vigorous, physical activity per week (An et al., 2016; Whitfield et al., 2021). Our assessment of the research literature on physical activity counseling programs suggests programs are designed to cover a narrow set of PAGs (e.g., aerobic PAGs for active adults; Calle et al., 2016; Wattanapisit et al., 2018). Moreover, continuing education workshops may not raise the issue of misinformation from health-related practitioners as part of their content or practicum instruction (Breckon et al., 2008; Wattanapisit et al., 2018). While overlap exists between PAG categories, specific guidelines raise important considerations for practitioners to keep in mind when counseling or providing resource material to patients and clients (U.S. Department of Health & Human Services, 2018). The purpose of this study was to examine the potential of one brief 2021 training video designed to enhance workshop (or classroom) PAG-instruction, by raising the need to understand the breadth of PAGs that exist and why PAG-miscommunication is problematic. Preliminary research on workshops not focused on PAGs suggests that educational videos can enhance workshop learning outcomes (Dilley et al., 2014; Johannesmeyer et al., 2023; Wolf et al., 2020). Moreover, problem-focused training videos may promote positive attitudes toward meeting evidence-based guidelines (Dilley et al., 2014; McNamara & Shaw, 2022). While research suggests training videos could enhance PAG-instruction within kinesiology undergraduate courses and elsewhere (McNamara & Shaw, 2022), we could not locate previous research in this specific area (e.g., using the terms "training video" or "educational video" and "physi-

cal activity” guidelines or counseling).

## 2 Methods

The present study was an exploratory investigation using pilot data collected on the quality (including face validity) of one training video (Love et al., 2021), which was produced in April 2021 by a California State University-based research lab focused on knowledge translation in kinesiology. The potential of the video to enhance PAG-instruction was critically appraised using qualitative feedback from its pilot test, which was descriptively analyzed in the present study. The university’s institutional review board reviewed and approved the protocol used to administer the pilot test of the training video.

### 2.1 Video Description

The training video was a pre-recorded slideshow presentation. It focused on summarizing the results of one published peer-reviewed study, which examined how well advice from web articles matched US-adult PAGs (Thomas & Cardinal, 2020). An interactive exercise was created, allowing the audience to replicate the study’s method of analyzing how well example text from one real-world web article matched strength training PAGs for sedentary or untrained adult populations. Text and graphics were used to summarize the research article (e.g., Figure 1). The video was concluded with a summary of its key points, followed by QR code links to additional resources (including a free online quiz based on the video and created using the web application *ProProfs*; Edwards, 2021). Guidelines for making distraction-free and plain-language presentations were used (Beqiri, 2018; The University of Melbourne, 2020). The slideshow was recorded using Screencast-O-Matic<sup>2</sup> and narrated using a typed transcript (Smith et al., 2022). A polished draft of the video was pilot tested (duration = 6.5 minutes). Feedback was used to finalize the video before it was published.

### 2.2 Participants

Fourteen individuals were invited to participate in the study. Participants were restricted to individuals 18 or older, attending or who graduated from

a 4-year institution of higher education, and affiliated with the university lab between January and April of 2021 (i.e., research assistant). Given the focus of the pilot test was to appraise the quality of the training video (including its face validity), demographic data was not collected on the pilot test participants.

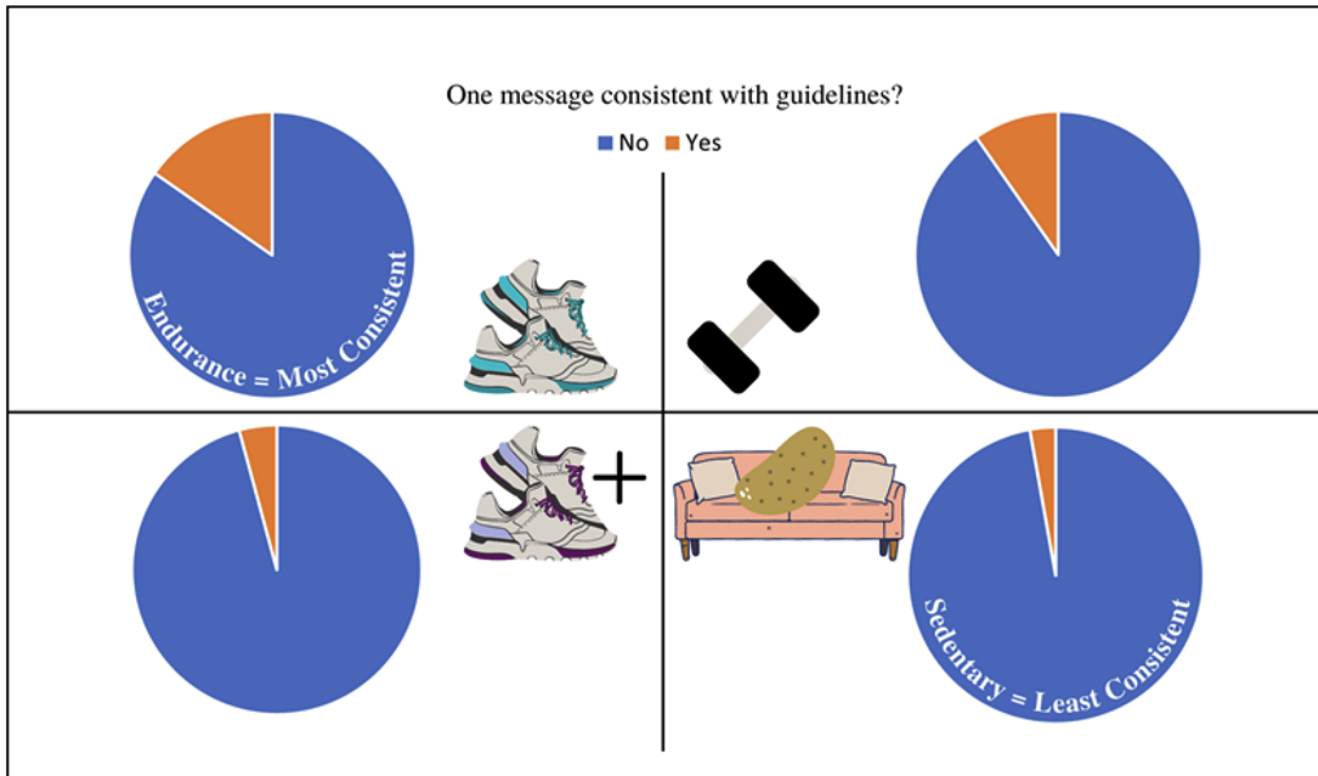
#### 2.2.1 Pilot Test Questions and Protocol

The protocol by Smith and colleagues (2022) was adopted in the present study. The video’s quality was assessed using an online questionnaire administered through a web application (i.e., Google Forms). There were five questions asking about the strengths and weaknesses of the video (see Table 1). For weaknesses, participants were asked to explain their observations. Participants had the choice to respond not applicable (i.e., N/A) to any question. The form was available to study participants for seven consecutive days. Consistent with social exchange theory, those invited to participate in the study were informed/reminded that their participation was voluntary, anonymous, and would be appreciated and helpful (Dillman et al., 2014). Email and text message notifications were used to communicate with participants. The response rate was 57.14% (n = 8).

**Table 1:** Pilot Test Questions in Order Presented to Participants

Question #	Question
One	What is at least one way this PowerPoint presentation could be improved?
Two	For each way the PowerPoint could be improved, what do you suggest we do specifically to meet your recommendation?
Three	What is at least one strength of this PowerPoint presentation?
Four	Do you have any suggestions to improve the grammar and/or spelling used in the video?
Five	Is there any other feedback you may have that was not addressed in the previous sections? If yes, please comment below. If no, please say so.

<sup>2</sup>Before this article’s publication, the name “Screencast-O-Matic” was changed to “ScreenPal” (Edwards, 2023).



**Figure 1:** Training video pie chart. It shows portion of PA promotion web articles with at least one message matching PAG guidelines (i.e., orange portion). The data are from the case study research article discussed in the training video (Thomas & Cardinal, 2020).

### 2.2.2 Analytic Plan

This study (March-May 2023) was post-priori to the video's pilot test. We adapted the RE-AIM (Reach, Efficacy/Effectiveness, Adoption, Implementation, Maintenance) framework to critically appraise the quality of the training video (Glasgow et al., 2003). The RE-AIM framework is used to analyze whether an intervention would produce real effects beyond random chance and the likelihood those effects would occur within real-world settings (Glasgow et al., 2003). Pilot test responses were organized within a table. A descriptive qualitative analysis was then performed (Elliott & Timulak, 2021), which compared responses to applicable RE-AIM dimensions (i.e., reach, efficacy, adoption; Wu et al., 2022). The first author performed the qualitative analysis. The second author acted as a critical friend, who independently verified the trustworthiness of the results and discussion points produced by the first author (i.e., complete, accurate, and logical; Thomas et al., 2022a). The second author concurred fully with the first author; they judged the first author's analysis to be succinct and fully

representative of the data.

## 3 Results

Two tables present the verbatim feedback from the pilot test participants. Table 2 presents areas for improvement. Table 3 presents strengths. No major concerns were identified by the participants (e.g., biased/offensive language). All suggestions were feasible and minor (e.g., add pauses; further explain one graph, the pie chart). Participants unanimously commented that typographic errors (e.g., spelling or grammar) were absent in the video. Strengths of the video identified by participants fit within at least three themes: (a) excitement or enthusiasm for the speaker's presentation style, (b) appreciation that only pertinent information was provided in a clear manner, and (c) satisfaction that the video was concise yet thorough and informative. Except for the feedback to change the slideshow background color, because that would have run counter to guidelines (Beqiri, 2018; The

University of Melbourne, 2020), edit suggestions from the pilot study participants were incorporated into the final draft of the training video (i.e., the transcript narration was revised, pauses in narration were incorporated, and closed captioning were added using the *YouTube Studios* webtool; Mbugua, 2021).

### 3.1 RE-AIM Results

According to the descriptive qualitative appraisal, the training video corresponded to each RE-AIM element considered in the present study.

### 3.2 Reach

Studies should purposefully select volunteer research participants and delineate inclusion criteria, which was done in the present study. Seven of the eight participants in the pilot study (87.5%) were undergoing professional preparation focused on health and wellness promotion. These participants were research assistants in the first author's lab, aspiring towards a career in health promotion and working to earn a Bachelor of Science degree in kinesiology or public health.

#### 3.2.1 Efficacy

There was one efficacy criterion from the RE-AIM framework applicable to the present study: to assess both positive (anticipated) and negative (unanticipated) outcomes of an intervention. The pilot test provided insight into the training video's possible positive and negative outcomes. The positive outcomes observed were prevailing perceptions that the video would be helpful. For example, participants commented that the video was concise, informative, and easy to follow. Responses also suggested that participants found the content stimulating. This implies they enjoyed their engagement through the video, which included visual media, interactive exercises, and hyperlinked resources using QR code images. Negative (unanticipated) outcomes were identified through the feedback. One participant was confused by a graph used to summarize findings, even after re-watching that video segment three times. Others felt the video narration could be improved in some places, such as by adding pauses and reiterating statistics within the video's conclusion. The final draft addressed these potential hindrances. Detail was added for greater explanation and orientation of the pie-chart graph, pauses between speaking were

**Table 2:** Feedback on What to Improve in the Training Video and How to Do It

Participant	Feedback
One	"The 4 pie charts were confusing. Find a way to better explain and differentiate between the 4. I watched over that section 3 times and I still have confusion on those pie charts."
Two	"I think providing closed captioning may be beneficial! It helps the viewer read what she is saying as well as gain info from the slides themselves. You can upload to YouTube, caption it manually, and then download it as the final transcript."
Three	"The slides looked great overall! I think one thing to maybe do is focus on the amount of words on the slides. I personally didn't have a problem reading but I know sometimes too many words can be distracting during a presentation. The most wordy part is the bold text on PAGE #16. I like how you bolded the important information. Maybe adding color to make the contrast greater or breaking it up over two slides would be helpful."
Four	"By adding more color/graphics to hold the attention of the viewer. I would recommend adding a colored background as the white space can lose viewers' attention."
Five	"Put in benefits of correct data availability and how do we make sure future articles follow guidelines. More stats."
Six	"I think it summarizes the study well and is clear. No specific improvements come to mind."
Seven	N/A.
Eight	"Make ideas more clear/concise. Speak with more purposeful pauses. Use more voice fluctuations/purposeful pauses to keep audience interested."

added, and key research findings were reiterated more directly within the video's conclusion slide.

**Table 3:** Feedback on What to See as Strengths in the Training Video

Participant	Feedback
One	"Graphics and minimal words."
Two	"Very thorough and concise! Information is conveyed without confusing the viewer."
Three	"The pacing and flow was really great!"
Four	"The presentation does a good job of explaining the graphics used and what they actually mean."
Five	"It was presented nicely."
Six	"It is concise and clear in presenting a thorough summary of the research that was conducted. I liked it!"
Seven	"Great graphics, love the use of QR codes, and neat presentation overall."
Eight	"Very informative, straight to the point."

### 3.2.2 Adoption

One of two criteria for appraising the adoptability of an intervention was met in the present study (i.e., to include proxy measures of adoption using members of a target group). The target group was college students whose majors/career interests correspond to health/wellness promotion. There was no negative attitude toward the video (e.g., disliked), but rather, participants generally favored the video. These findings about attitude are a proxy measure of adoptability. The video's duration is another proxy measure of adoptability. Classroom time constraints suggest educators would like audiovisual media that is short and valued by their students. Pilot test feedback suggests learners would value the video because it is relatively short, interesting, and helpful (i.e., succinctly summarizes the issue at hand). Direct assessment of adoptability, however, was not performed (e.g., direct inquiry with prospective instructors or administrators in charge of classroom or workshop instruction).

## 4 Discussion

The focus of this study was to examine the potential of one training video to enhance PAG-instruction

to pre and current health-related practitioners, delivered within workshop or classroom settings. Research points to a need to reinforce or clarify PAG-knowledge among health-related practitioners. Large portions of students and professionals seem to lack complete or accurate knowledge of PAGs that should be part of their communication repertoire when counseling clients/patients (Barton et al., 2021; Das et al., 2018; Douglas et al., 2006). Still, these knowledge gaps may not fully deter practitioners from encouraging or attempting to counsel patients or clients on physical activity (Das et al., 2018; Douglas et al., 2006). Arguably, these attempts are still meaningful and could be effective (Sanchez et al., 2015). While it may be beneficial for health-related practitioners to simply raise the subject of physical activity with their patients or clients, evidence-based, tailored communication is better (Sanchez et al., 2015). Without the opportunity to learn about PAG-communication or to verify their own PAG-knowledge, there is a risk that what practitioners advise about physical activity/exercise is imprecise and/or inaccurate. Surveys and interviews with specific populations report that laypeople feel exasperated about their lack of PAG knowledge (Health Information National Trends Survey, 2006; Maneze et al., 2019). Moreover, adults with low PAG-knowledge may be less physically active in a given week and more likely to reside within the precontemplation/contemplation stages of behavior change (Abula et al., 2018). This means while health-related practitioners may initiate conversations about physical activity or disseminate educational material through their office, what is relayed may often veer off-course to meeting the informational needs of patients/clients (e.g., inconsistent advice; unresolved safety concerns; Learmonth et al., 2017; Elshahat et al., 2021). These issues underscore the need to provide continuing education workshops in physical activity counseling and PAG-communication (Calle et al., 2016; O'Brien et al., 2017). They also stress the need to consider ways to enhance workshop and classroom instruction, given typical modes may be less than adequate (Ekkekakis et al., 2016; Zenko & Ekkekakis, 2015). The present study analyzed the potential of one training video to help health-related practitioners better counsel patients on physical activity (Cardinal et al., 2002). Using the RE-AIM framework, we found evidence that the video could be an effective teaching tool within classroom or workshop settings (Glasgow et al., 2003). Face validity was established through pilot test feed-

back. Further, efficacy and adoptability were inferable from participants' responses. All liked that the video was concise, interactive, and informative. These latter traits are critical, as the video's content focused on helping viewers understand blunders that practitioners may make when advising patients/clients about physical activity/exercise (e.g., contradicting guidelines for the current fitness level or activity habits of patients/clients). The training video was, in general, viewed favorably by pilot test participants, which aligned with the findings of previous research. First, pilot test participants praised the training video's brevity. Survey research shows college students may prefer educational videos that do not exceed 10-15 minutes in duration (Alpert & Hodkinson, 2019; Ottusch & Jordan, 2022). This has been reported for a traditional lecture format, where videos were embedded in the lecture as a class activity (Alpert & Hodkinson, 2019) and within asynchronous courses (Ottusch & Jordan, 2022). Second, the training video focused on a topic that may be uncommon in college courses or workshops that teach principles or strategies for physical activity promotion and counseling. The video taught a novel issue identified through research and using a real-world case example. These educational functions were among the top features popular with university students surveyed by Alpert and Hodkinson (2019). No function received greater than 46% of student votes in their survey, and the top three functions were videos that (a) add creativity, humor, or interest to the topic (45.9% of votes), (b) add variety to the class session (42.9% of votes), and (c) that either, explain a concept in a better way or present real-world examples (41.4% votes; Alpert & Hodkinson, 2019). Finally, the training video of the present study included a variety of interactive features midway through the video to quiz the viewer on what they retained from the video. Interactive features that test user knowledge or ability to apply content to a case example are viewed as helpful (Ottusch & Jordan, 2022). Learners feel these features support their learning and motivate them to pay attention to the video (Ottusch & Jordan, 2022). The generic open-ended questions during the pilot test asking participants to identify any weaknesses and strengths with the training video prevented a more in-depth analysis of its potential to enhance PAG-instruction, delivered through a university course or continuing education workshop. Previous research asked adult learners (undergraduate and graduate students) to rank features from most to least preferred (Alpert & Hodkinson, 2019; Ottusch

& Jordan, 2022), and previous research asked students to subjectively rate how well a video supported their content mastery (i.e., lecture-specific topics; Ottusch & Jordan, 2022). Findings from Alpert and Hodkinson's (2019) study offer caution about how videos are facilitated. Just as students preferred videos to cover an interest area, students were least favorable of videos perceived to add additional knowledge on topics covered in a lecture. On average, approximately 60% of students preferred videos to be introduced by the instructor (e.g., its synopsis, why is it being shown, what to focus on when watching it), while 50% of students on average preferred instructors to facilitate a debrief of a video after it was shown in class<sup>3</sup>. Alpert and Hodkinson (2019) also found videos that simply explained a concept in a different way or summarized a lecture were the least preferred features. Prefacing how the training video supports the learning objectives of a lecture or workshop, or provides real-world examples of covered topics, could motivate learners to pay attention to and understand the video's content (Alpert & Hodkinson, 2019). Additionally, the most preferred video interactive feature within the study by Ottusch and Jordan (2022) was embedded multiple-choice test questions (followed by open-ended reflective-pause and answer-prediction questions). The training video analyzed within the present study outsourced its multiple-choice test questions to a separate website application, rather than embedding them at different points within the video. Learners may perceive the embedded design feature as more helpful to their learning (Carter-Roberts et al., 2021; Ottusch & Jordan, 2022). Moreover, embedding multiple-choice test questions may better motivate learners to understand a video's content (Carter-Roberts et al., 2021; Ottusch & Jordan, 2022).

#### 4.1 Limitations

The present study contains limitations that should be kept in mind when interpreting its results. First, the aim of this study was not to generalize to specific populations of students or professionals, but rather to delineate effective and ineffective features of the training video (Kamp & Thomas, 2022). Analysis of pilot test feedback elucidated several strengths of the video which should enhance its perceived utility to end-users. Future research should investigate if similar findings are observed in diverse samples of college students (i.e., gradu-

<sup>3</sup>The reported average is the median value, computed from Table IV of the Alpert and Hodkinson (2019) study.

ate and undergraduate students) and professionals working in the field. Second, the sample size used in the present study was fairly small, which may affect the reliability of the observed trends (i.e., pilot testing in another sample of similar size or larger may result in the identification of different strengths and weaknesses). Moreover, responses favoring the video may have been influenced by pilot testers' affiliation with the lab (e.g., all students were mentored by the same faculty mentor, though uninvolved in the video's creation, and the feedback they provided was done anonymously). Thus, caution should be taken when drawing conclusions on the potential strengths and weaknesses of the present training video. Future research should test the video and other works with an unaffiliated audience recruited specifically to pilot test the materials (DeWalt et al., 2011; Le Marne et al., 2023). Third, the present study used a cross-sectional design to analyze the training video. Studies employing a pre-post design could capture potential ways the video might affect end-user knowledge, specifically in their ability to identify inappropriate or inaccurate communication of physical activity guidelines (Kamp & Thomas, 2022). Moreover, the utility of the training video was not evaluated within an instructional context involving students nor with professionals or clinicians working in the field (e.g., embedded within a course or workshop activity; Ross & Thomas, 2022; Zenko et al., 2023). This could affect the type of responses received about its strengths and weaknesses (e.g., does the video support meeting specific learning objectives or requirements of an activity or assignment; Carter-Roberts et al., 2021). Thus, future research should not only evaluate training videos within a learning environment involving more representative samples (Carter-Roberts et al., 2021), but it should also solicit feedback from course instructors or workshop leaders.

## 4.2 Conclusion

Physical activity promotion continuing education workshops for health-related practitioners focus on effectively communicating PAGs to patients/clients. Although audiovisual educational material may positively affect learning outcomes in kinesiology courses and related workplace training programs, limited research has focused on PAG instruction within classroom or workshop settings. The present study examined, qualitatively, the potential of one training video to aid current and future health-related practitioners in accu-

rately and appropriately communicating PAGs to patients/clients. The video's potential was evidenced using the RE-AIM framework. Results suggested learners may positively view the training video, given its brevity, summary of relevant research, and use of several interactive features to elicit understanding. Future research directions were presented based on the findings and limitations of the present study.

## Conflict of Interest

The authors have no conflicts of interest to declare.

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## 4.3 Acknowledgements

The project leading to the present article received funding support from The William and Linda Frost Fund, in the form of a *Frost Undergraduate Student Research Award* awarded to the third and fourth author (BCL, CNS), who served as Frost Research Fellows to the project during the 2021 Winter Quarter (Bailey College of Science and Mathematics, California Polytechnic State University, San Luis Obispo, USA). Additionally, a previous iteration of the present article's manuscript received comments on ways it could be strengthened from Dr. Bradley J. Cardinal (Professor, Kinesiology Program, School of Exercise, Sport and Health Sciences, College of Health, Oregon State University, Corvallis, Oregon, USA). The authors thank Dr. Cardinal for his instrumental feedback, which improved the write-up of the present article. Finally, the authors are grateful for receiving the opportunity to present elements of this article at the 2023 Annual Meeting of the Western Society for Kinesiology and Wellness (October 5-6, 2023, in Oakland, California, USA), as the Society's 2023 Young Scholar Award Presentation, delivered by the first author, the award recipient.



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