

## POINT OF VIEW

# Will Dodgeball Ever Die? Former K–12 Students’ Experiences and Perceptions of Playing Dodgeball in PE Class

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## Abstract

*When discussing the game of dodgeball, people usually discuss it with fond memories and excitement for the thrill that came from the game. Then there were those who strongly disliked it for reasons that it was embarrassing, hurtful, and just not fun. The game of dodgeball has been played by many students in their physical education (PE) classes, for better and for worse. The purpose of this study was to better understand the perceptions, experiences, and opinions of recently former K–12 students toward dodgeball in PE. The results of the study indicate that generally males more than females view dodgeball as appropriate and competitive.*

For many, perhaps most, students who participated in K–12 physical education (PE), the following scenario likely played itself out, beginning with the teacher announcing,

“Today, we are going to play dodgeball. There will be two teams and eight balls. If you get hit by a thrown ball, off you go to the sidelines until the last player is standing.”

While rules vary, generally students are divided into two teams with the balls placed at midcourt, the whistle blows, and the game

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begins. Students rush forward, retrieve a ball, and throw it at opposing players in hopes of eliminating them. Some—often the most athletic, early-maturing students—are having the time of their lives. They dodge, jump, and duck to avoid being hit by an opponent’s ball. Some, cleverly, use a retrieved ball to fend off thrown balls. The very confident, brave, or foolish stand in the open, daring the opposition to take their best shot. You see, if they catch the ball, the thrower is eliminated. Players from both sides get hit on the arms, legs, torso, groin, or a full-facial! Ouch! Some are hit so hard that they are knocked off their feet.

If a player is struck with a thrown ball, they move to the sidelines, relegated to spectator status. Some teachers allow players to be recycled if, for example, a thrown ball is caught. The game is exciting, energetic, and athletic. Often the sense of self-preservation provides students with the motivation to run, dodge, leap, zig and zag, and throw and catch, all while raising heart rates (as high as 150 bpm; Strand et al., 1997)—all desirable outcomes for PE students. What a game! Who would *not* love this game?

As it turns out, many students do not like this game, going so far as to employ avoidance strategies. Some move quickly to the middle ground, sacrificing themselves to the first ball that sends them to the sidelines. Others hide near the far wall, hoping to hide in plain sight or at least dodge the longer throws. Eventually, they are struck and sent to the sidelines where they, along with the early sacrificial players, happily stand, doing nothing as the game proceeds. “It is better than getting pelted,” they reason. For them, dodgeball is not an enjoyable PE experience. Nonetheless, for good or bad, dodgeball has been and continues to be a PE standard.

The cumulative effects of negative dodgeball experiences led the National Association for Sport and Physical Education (NASPE, 2006) to release a position statement specific to the *appropriateness* of dodgeball in PE:

NASPE believes that dodgeball is *not an appropriate* [emphasis added] activity for K–12 school physical education programs. The purpose of physical education is to provide students with: the knowledge, skills, and confidence needed to be physically active for a lifetime. A daily dose of physical activity for health benefits. *Positive experiences* so that kids

want to be physically active outside of physical education class and throughout their lifetime. (p. 1)

NASPE has created three consensus statements outlining *appropriate* and *inappropriate* instructional practices with the intent to guide physical educators in elementary (2009a), middle school (2009b), and high school (2009c) PE and to “address key aspects of instructional strategies and practices that are essential to delivery of quality physical education to children, adolescents and young adults” (NASPE, 2009, p. 3). Appropriate practices include “Activities are selected carefully to ensure that they match students’ ability levels and are *safe* [emphasis added] for all students, regardless of ability” (NASPE, 2009b, p. 3) Inappropriate practices include “Human-target games (dodgeball) and/or drills that allow aggressive behavior toward other students” (NASPE, 2009c, p. 11). In all three of these documents, dodgeball is considered an *inappropriate instructional practice at all levels*. On its face, dodgeball is an elimination game where the least capable players get eliminated quickly, while the most gifted players get all the play time—a case of the rich getting richer? Those who need the repetition and refinement to gain skill and the physical activity to produce health benefits are sitting on the sidelines. All things considered, there seems to be little to recommend dodgeball in the public schools. Indeed, dodgeball has earned an ignominious place on the PE Hall of Shame (Williams, 1992).

These NASPE consensus statements have afforded Barney and his colleagues the opportunity to investigate knowledge of instructional practices in K–12 PE across a variety of populations. For example, Barney and Pleban (2010) investigated parents’ knowledge of appropriate instructional practices in elementary PE. Parents were surveyed and asked to identify the appropriateness of common instructional practices, including dodgeball. Parents misidentified as appropriate the following statement: “Teachers may use activities such as relays, dodgeball, and elimination tag since they provide opportunities for everyone in the class.” Surprisingly, 84% of the parents felt dodgeball was an appropriate practice in elementary PE. The researchers surmised that if parents were to recall their PE experience—positively or negatively—dodgeball would probably be *the* activity that defined their PE experience. Similarly, 75% of school administrators (Barney & Prusak, 2016) misidentified dodgeball as

appropriate for K–12 PE. Some administrators did, however, place certain conditions on the practice. One principal stated, “Dodgeball is fine to play, if done correctly . . . if it is played with soft balls . . . [and] . . . played occasionally, not all the time.” As for the students, Barney and Christenson (2014) surveyed third- to fifth-grade students and 87% of males and 68% of females felt dodgeball is an appropriate activity for PE class.

These studies illustrate that dodgeball is not only commonplace in virtually everyone’s PE experience but is also deeply engrained across all segments of society—almost a given, something not even to be questioned. Curiously, it seems to be a highlight of the PE experience. Other names for dodgeball including “murderball,” “warball,” “killerball,” and “poisonball” (Crockett, 2014) provide a perverse sense of eagerness toward the game. Further, dodgeball jargon such as “headshot,” “kill ratio,” “hit,” and “shooting” (Fagogenis, 2010) brings into question how the game or its verbiage could possibly be considered appropriate.

On the other hand, there seems to be staunch support by the majority of former and current participants cautioning against overlooking the merits of the game. After all, the embattled PE game has spawned recreational (a popular spinoff game is played on a surface of trampolines; Sky Zone, 2019) and professional leagues and movies (Cooper et al., 2007).

Although limited, research does exist that presents dodgeball in a more favorable light. Thinking to convince a local teacher why dodgeball should not be included in PE (limited student engagement and resultant lack of cardiovascular fitness), Strand et al. (1997) used heart rate telemetry to investigate. Over 4 days, three classes of seventh-grade male students wore heart rate monitors as they played a version of dodgeball called “Road Warrior.” The first day 10 balls were used; the second day, 15 balls; the third day, 20 balls; and the fourth day, 25 balls. One of the findings from this study was that one class averaged over 140 bpm for 17 min of class time. The other two class periods had similar results. Interestingly, 45% of the students had lower beats per minute when participating in a fitness run during class. Strand et al. concluded that although activity rates did not suffer (as they had supposed), the chance of injury must be weighed carefully in the decision to include dodgeball.

Another population with a vested interest in this debate is K–12 physical educators. The *Journal of Physical Education, Recreation and Dance* (“Is There a Place,” 2001), posed the question, “Is there a place for dodgeball in physical education?” soliciting input from the teachers themselves. A female participant stated,

“As someone who enjoyed dodgeball as a kid, I believe that there is a place for this game in physical education. Dodgeball is a great way for students to enjoy participating in physical education while learning a variety of movement skills” (p. 18). Another K–12 PE teacher stated, “I graduated college with the notion that dodgeball was not an acceptable activity in physical education. However, I now believe that with modifications, dodgeball can be both an effective and fun activity for all students” (p. 19). Another K–12 PE teacher said,

Safety is the first issue that needs to be addressed in the game. The equipment used should be such that the chance for injury is decreased . . . In my opinion, the advantages of the game outweigh the disadvantages. If students are instructed and supervised properly, the game can be beneficial to a physical education program, not to mention fun. (p. 20)

For the past two decades, the debate over dodgeball has raged on. At its core, the issue revolves around the rationale of playing human-target games, primarily for safety reasons. But the popularity of the activity is undeniable. Teachers seem to have made modifications (e.g., equipment, object-targets, role variation to avoid being a human target if students wish, and additional recycling strategies) to reduce unnecessary risk and to take full advantage of the high levels of physical activity. As with any debate, there seem to be arguments both for and against dodgeball. Thus, in a time when positions statements (NASPE, 2006) have largely condemned dodgeball, it seems as popular as ever.

On one side, parents, students, administrators, and PE teachers give at least tacit approval, while, on the other, researchers and NASPE condemn the practice. We do not take a philosophical stand for or against the practice. Although the majority of previous populations studied seem to endorse dodgeball, we wonder about the minority who do not. We also wonder about those who grew up in

this time of mixed messages with respect to dodgeball. Therefore, the purpose of this study was to better understand the perceptions, experiences, and opinions of recently former K–12 students toward dodgeball in PE.

## Method

### Participants

A convenience sample of 239 college students (113 males, 126 females) from a private university in the western United States participated in the study. Participants for this study were enrolled in five university physical activity classes (basketball, bowling, volleyball, weight training, and Zumba). Each participant received, signed, and returned a letter of informed consent and university IRB approval was granted.

### Instrumentation

Based on the literature dealing with dodgeball, we developed eight statements (see Table 1), assessed on a 5-point Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*). Additionally, students were asked to provide reasons for their answers on each statement. Two survey questions asked about the participants' experience with dodgeball. One survey question was open-ended. The concluding section of the survey addressed demographics. To establish content validity, we asked four college students and two PETE faculty to read through the survey questions, to ensure clarity and understanding of the instrument for the intended population. Further, the survey was pilot tested on 10 nonparticipant college students and was found suitable to its proposed purposes.

### Procedures

We sought and attained permission from university, IRB, the department supervisor, and the individual course instructors to recruit students for this study. We attended each physical activity class, explained the purpose of the study, collected signed letters of informed consent, and administered the 10-min survey to the 263 students who participated in this study. Ninety-eight percent of the students agreed to participate in the study. All students were assured that

## Table 1

### *Eight Items to Assess Perceptions of Dodgeball in Physical Education*

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The following survey questions will ask you about experiences with dodgeball in your K–12 physical education classes. Questions will ask you to circle and respond from your experiences with dodgeball in your K–12 PE. Thank you for participating in this survey.

1. Where did you first learn to play dodgeball?
  - a. PE class
  - b. Afterschool
  - c. Playground
  - d. Recreation center
  - e. Other (specify)
2. How often did you play dodgeball?
  - a. Daily
  - b. Weekly
  - c. Twice monthly
  - d. Monthly
  - e. Less than once per month

Use the following scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*) for the next four questions:

3. Dodgeball is an appropriate game for physical education  
Please explain you answer:
  4. Dodgeball doesn't allow for the less-skilled kids to get better.  
Please explain you answer:
  5. Dodgeball is an inappropriate game for physical education  
Please explain you answer:
  6. Dodgeball is a form of bullying.  
Please explain you answer:
  7. Dodgeball is an appropriate game for co-ed PE classes.  
Please explain you answer:
  8. Based on your experience with dodgeball, has it had a *positive* or *negative* effect on your physical activity choices and habits.  
Please explain you answer:
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their voluntary decision to participate or not to participate in the study would not affect their grade or standing in the class.

### Quantitative Data Analysis

Response frequencies; means and standard deviations (see Table 2); correlations (see Table 3); and tests for normality, effects sizes, and between gender differences (see Table 2) were calculated for each of the nominal variables.

**Table 2**  
*Means, Standard Deviations, and Effect Sizes*

Question	<i>N</i> = 239		<i>M</i>		<i>SD</i>		$\eta^2$
	Male	Female	Male	Female	Male	Female	
Q3: appropriate	113	126	4.04***	3.25	.97	.93	.15
Total	239		3.62		1.03		--
Q4: affects skills	113	126	2.60***	3.22	1.0	1.1	.09
Total	239		2.93		1.06		--
Q5: inappropriate	113	126	2.12***	2.75	.91	.94	.10
Total	239		2.45		.98		--
Q6: bullying	113	126	2.18***	2.82	.97	.88	.11
Total	239		2.51		.97		--
Q7: co-ed OK	113	126	3.59***	3.18	.96	1.11	.04
Total	239		3.38		1.06		--

*Note.* Questions 3 and 5 (in boxes) asked the same question in opposite directions (i.e., dodgeball is *appropriate* [Q3] or *inappropriate* [Q5]) and yielded nearly identical results.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Open-Ended Responses

Open-ended questions asking for participants to provide reasons for answering the survey question as they had were compiled, transcribed, and content-analyzed and offered as anecdotal, supplementary evidence only.

**Table 3**  
*Pearson Correlations*

Question	Q2	Q3	Q4	Q5	Q6	Q7	Gender
Q2: how often		-.199**	.150*	.202**	.079	-.135*	.106
Q3: appropriate			-.451**	-.507**	-.386**	4.98**	-.390**
Q4: affects skills				.440**	.403**	-.336**	.294**
Q5: inappropriate					.437**	-.374**	-.317**
Q6: bullying						-.318	.329
Q7: co-ed OK							-.193**
Gender							

\* $p < .05$ . \*\* $p < .01$ .

## Results

### Quantitative Results

#### *Frequency Analysis*

Results revealed that, by in large, dodgeball is contextually a PE phenomenon with 74.5% of participants reporting that they first learned to play the game in PE. The remaining 25.5% were introduced to the game in after-school, playground, recreational, or other settings. Thus, it can be surmised that the majority of perceptions toward the game can be linked most prominently to PE classes. Next, participants reported having played dodgeball daily (1%), weekly (23%), twice monthly (28%), monthly (19%), and less than once per month (30%).

With respect to the appropriateness of dodgeball, Questions 3 and 5 (asked in opposite directions) revealed consistent results. Fifty-nine percent (39% *agree*, 20% *strongly agree*) of all participants reported that they considered dodgeball as an appropriate activity for PE.

Question 4 addressed the proposition that dodgeball would lead to students with lesser skills to be eliminated early or, perhaps, by choice would be denied skill-building opportunities. Results revealed that students were equally split (7.5% *strongly disagree*, 33% *disagree*, 22.2% *neutral*, 34% *agree*, and 3.8% *strongly agree*).

A current concern with respect to all forms of bullying prompted us to consider if the aggressive nature of dodgeball might lead to bullying smaller, lesser skilled individuals within gameplay. Forty-eight percent of the participants (17% *strongly disagree*, 14% *disagree*, 37% *neutral*, 14% *agree*, and 1% *strongly agree*) that dodgeball might be a form of bullying.

#### *Descriptive Statistics Analysis*

Data were examined and found to be normal ( $r_{\text{skewness}} = .08-1.30$ ,  $r_{\text{kurtosis}} = .33-1.5$ ). Means, standard deviations, effect sizes, and Pearson correlations were calculated for each of the nominal questions and compared across genders. Overall means indicated that (a) participants agreed that dodgeball was appropriate for PE (Q3&5:  $M = 3.62$ ), (b) disagreed that dodgeball led to less skill acquisition

(Q4:  $M = 2.60$ ), (c) disagreed that dodgeball was a form of bullying (Q6:  $M = 2.51$ ), and (d) agreed that co-ed dodgeball was appropriate (Q7:  $M = 3.38$ ). However, no mean score was decidedly *strongly agree* or *strongly disagree*. Rather, means reflected scores slightly above or below a neutral response (i.e., a score of 3) with the exception of males (Q3:  $M = 4.04$ ).

Correlational analysis (see Table 3) revealed that (a) the more often students played, the more appropriate dodgeball became ( $r = -.199$ ); (b) the more appropriate the students felt dodgeball to be, the less they thought it affected skills ( $r = -.451$ ); (c) the more appropriate the students felt dodgeball to be, the less they considered it to be a form of bullying ( $r = -.386$ ); (d) the more appropriate the students felt dodgeball to be, the more they thought it appropriate for co-ed participation ( $r = .498$ ).

Comparison tests (see Table 2) revealed significant (Bonferroni adjusted,  $p < .0125$ ) gender effects. Females (a) considered dodgeball to be significantly less appropriate than did males, Q3:  $F(1, 237) = 42.40, p < .000$ ; Q5:  $F(1, 237), p < .000$ ; (b) were significantly more likely than males to say that dodgeball adversely affects skill acquisition, Q4:  $F(1, 237) = 22.38, p < .000$ ; (c) were significantly more likely than males to consider dodgeball as a form of bullying, but still generally disagreed that it did, Q6:  $F(1, 237) = 28.78, p < .000$ ; and (d) were less likely than males to consider dodgeball to be an appropriate co-ed game, Q7:  $F(1, 237) = 9.21, p < .01$ .

## Open-Ended Responses Results

### Questions 3 and 5

Participants provided additional insight for the reasons they answered Questions 3 to 8 as they did. In response to the appropriateness of dodgeball in PE, they gave the following comments:

To many who like PE it was a blast, but if you were shy, not athletically inclined, or had not friends in the class, it was horrible. (Student 1)

As much as I like it, I think most of the time at least one student comes out unhappy. (Student 2)

It's not inherently inappropriate but can become a form of bullying if unchecked. (Student 3)

I feel that it doesn't teach students anything. But it is a fun game. (Student 4)

#### *Question 4*

When asked if dodgeball does not allow for the less-skilled players to get better, participants responses included the following:

Kids who have confidence do very well; however, this game knocks out kids that don't have much activity immediately eliminating further activity . . . Mostly the dominant players take over the game. (Student 5)

I never improved because I would get hit as soon as I got back in the game. (Student 6)

Dodgeball doesn't teach physical skills and isn't enjoyable for many people, especially girls. (Student 7)

#### *Question 6*

Participants were asked if dodgeball is a form of bullying. Student responses for this statement included the following:

When I got older, kids would use it to pelt kids they didn't like or make fun of those that were weaker. (Student 8)

While I love the game, sometimes kids will pick on others. This happens in other sports as well. (Student 9)

It can be [a form of bullying]. Media has painted it as such so those stereotypes are fulfilled in reality. (Student 10)

#### *Question 7*

Participants were asked if dodgeball is appropriate for co-ed PE. Responses included the following:

Guys throw much harder than girls, it makes most girls feel weak or helpless even if they aren't in the other sports. (Student 10)

Boys have a big advantage usually they can throw the ball a lot harder. (Student 11)

It isn't very fun for most girls, who get out very quickly and generally can't throw as well as males. It is frustrating as a girl. (Student 12)

Boys hit harder (: (Student 13)

### *Question 8*

Finally, participants were asked if their experiences playing dodgeball in PE class had a positive or negative effect on their physical activity choices and habits. Interestingly, both positive and negative responses were represented including the following:

It's fun and gets people active but doesn't teach things like staying active on your own. (Student 14)

I did not enjoy dodgeball in elementary school and so I pursued other sports, which led me to running in high school. (Student 15)

It made me not look forward to PE class. I avoided physical activity for some time. (Student 16)

## **Discussion**

The purpose of this study was to better understand the perceptions, experiences, and opinions of recently former K-12 students toward dodgeball in PE. It was generally found that dodgeball holds more appeal to males than females. From the male perspective for this study, they felt that dodgeball allowed them to show off their athleticism. Female statements such as the "guys throw harder than girls and it hurts" and the "girls were always the first to be hit and

out of the game” reinforced why males liked playing dodgeball in PE class. The results revealed positive and negative experiences from playing dodgeball in PE. The literature shows both positive and negative perceptions, experiences, and opinions regarding dodgeball.

### **Positive Aspects of Dodgeball**

From a positive perspective Strand et al. (1997) discovered that when junior high males played dodgeball for 35 min they maintained a higher heart rate than when they participated in a fitness run. Barney and Christenson (2014) studied elementary-aged students’ knowledge of appropriate instructional practices in elementary PE. Of the many instructional practices elementary students were asked about, they felt dodgeball was appropriate to play in PE. In the Barney and Christenson study, elementary-aged students were not asked why they liked playing dodgeball in PE class and there was no qualitative data. Yet, in this study, students used phrases such as “[Dodgeball] is a blast,” “It is fun trying to knock out your friends,” and “It was fun trying to not get hit.” These studies highlight the positive attitudes and effects of dodgeball on those who participate.

### **Negative Aspects of Dodgeball**

Looking at the negative side of dodgeball, Williams (1992) highlighted a number of inappropriate instructional practices that are considered a part of the Physical Education Hall of Shame. The top inappropriate instructional practice was dodgeball. Williams stated that dodgeball’s main focus is to inflict pain, harm students, and embarrass the opponent. Williams continued by stating that dodgeball “may have done our profession more harm than any single factor” (p. 57). In this study, students stated that dodgeball was “a form of bullying,” “Kids can pick on others,” and “Dodgeball makes girls appear weak and helpless.” Barney and Deutsch (2009) studied elementary classroom teachers’ attitudes and perceptions of elementary PE. Classroom teachers were asked what some of their experiences were in elementary PE. For example, it was stated, “All I remember was running and dodgeball.” Another statement was, “Dodgeball, fat kid, no encouragement, nor variety of activities.” These types of experiences do not bode well for PE.

One might think that the dodgeball dilemma had long been put to rest. That does not seem to be the case—52% of the participants

in this study reported playing dodgeball at least twice monthly. Dodgeball seemingly remains a staple in the majority of current PE practices. Sure, some modifications have been made, but it is clear that many PE teachers and students are not willing to let go of this popular game. Even parents (Barney & Pleban, 2010) and administrators (Barney & Prusak, 2016) are seemingly okay with the game, so why are we still rooting around on this topic? As researchers, we try to understand and, if possible, reconcile the polar opinions for and against a game.

Although the participants in this study, as well as the majority of each of the populations we have studied in the past, are in favor of dodgeball in PE, not all are. In particular, the participants in this study agreed only slightly more than neutral that the game was appropriate. Not surprisingly, males found the game more appropriate, less likely to affect motors skills acquisition, and less likely to consider it bullying, or more appropriate for co-ed play than did the females. Therefore, we caution against overstating perceptions of dodgeball as appropriate for PE for all.

We are also concerned with those who are least attracted to the game: those who are perhaps most at risk of physical or emotional damage. Participants of in this study disagreed slightly less than neutral that dodgeball might be considered as a form of bullying. However, the 15% who agreed to some degree that it is should not be overlooked.

The data from this study present attitudes, experiences, opinions, and perceptions of former K–12 PE students. We are not taking a philosophical stand for or against dodgeball in PE class. The data were presented, and we are letting the reader make their own conclusions.

### **Dodgeball With a Twist: Practical Applications and Future Research**

Modifying the game can remove or mitigate the use of human targets and increase the safety. For example, using bowling pins along the end line as targets or using an earth ball to be driven across opposing lines to score a point provide plenty of throwing and target practice. When the pins are all knocked down, the game ends. Or combine both into a game. A student may wish to guard a pin or

perhaps catch a ball in hopes of returning an eliminated player. But that is their choice.

One can also include alternative recycling strategies to limit the amount of time eliminated players spend along the sidelines. Most versions of the game provide for a caught ball to reenter one eliminated player. Here are some other possibilities: Establish a safe zone in enemy territory (e.g., the circle at the free-throw line, outside the three-point line, or from the center circle) where a student can attempt to score a basket. If they make the shot, some or the entire sideline is allowed back into the game. Creativity can provide all of the enjoyable elements of dodgeball but also include additional motor skills practice (e.g., shooting baskets). We recommend further that the game be played with soft, lightweight foam balls. Never use rubber playground balls or volleyballs. Ban all headshots.

We strongly argue against gameplay that forces all players to be human targets. Create a game where some are allowed wear red jerseys that place them in a nontarget role and have them perhaps retrieve balls for the throwers. We also caution about playing co-ed dodgeball in its traditional form. Some females are certainly capable, competitive by nature and might wish to play against the males, but probably not all. Using some of the suggestions or other appropriate ideas might help you create a game that is both enjoyable and socially reinforcing.

It is unlikely that dodgeball or the controversy surrounding it will be going away any time soon. It is far more likely that with some creativity, teachers can develop a version of the game that retains all of the desirable physicality, activity, and skills practice while maintaining an appropriate safety levels.

In regard to future research, researchers can interview current PE teachers to better understand why they might have their students participate in the game of dodgeball. Also, they can investigate current PE teachers' experiences with dodgeball and what they have observed as their students have played the game of dodgeball.

## **Limitations**

Because the participants came from one university, it may not allow a representative sampling of participants from other colleges or universities or geographic regions, thus limiting the generalizability of the findings. Additionally, the research study was conducted at

a private university, which may further limit the generalizability of the findings. Thus, the conclusions and implications are mostly applicable to those participants' demographics.

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