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Relationship Between Physical Activity and Stress Among Junior High School Students in the Physical Education Environment

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Title: Relationship Between Physical Activity and Stress Among Junior High School Students in
the Physical Education Environment

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Abstract

The study purpose was to explore grade level differences (7th, 8th, and 9th) among junior high school students' perception of participation in physical education class on individual environmental stress. Physical activity's role as a stress reduction tool has been well documented. However, physical activity as a stressful event in the school and physical education environment has been less established; particularly in junior high school students. Study participants were comprised of 872 junior high school students, 585 males (67%) and 287 females (33%), enrolled in four junior high schools. Stratified by grade, 315 7th grade students (228 males and 87 females) ($M = 1.28, SD = .448$), 281 8th grade students (204 males and 77 females) ($M = 1.27, SD = .447$), and 276 9th grade students (153 males and 123 females) ($M = 1.45, SD = .498$) responded. By grade level, significant differences ($p < .05$) were reported for five of the twelve scaling questions. In general, 7th graders were more likely to respond they could better handle stress after participating in PE class, looked forward to coming to their physical education, reported lower stress levels before arrival to PE class, and reported lower stress levels after participation in PE class, than 8th and 9th graders. Altogether, follow-up qualitative finding reported three major themes regarding the physical education environment and stress. Physical education acted as a stress mitigation mechanism and an opportunity for social bonding. Qualitative findings also referenced classmates as a negative stress mechanism in the physical education environment.

Key Words: Stress, Physical Education, Junior High School Student

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Introduction

Every person, at some point in time and at varying degrees, experiences stress. According to Grant et al. (2003), stress has been defined as “...environmental events or chronic conditions that objectively threaten the physical and/or psychological health and well-being of individuals of a particular age in a particular society” (p. 462). Because stress is an inevitable part of life, an individual needs to be equipped with healthy mechanisms to combat stressors. Physical activity is one positive stress management method to address life stressors (Aherne, 2001; Barney, Benham, & Haslem, 2014; Haugland, Wold, & Torsheim, 2003).

Literature specific to the relationship between physical activity and stress has indicated that physical activity is a likely mediator between stress and health (or illness) (Gill, 1994). Physical activity has been associated with a reduced psychological stress response (Rejeski, Thompson, Brubaker, & Miller, 1992) and decreased physiological responsiveness to physical and psycho-social stressors (Blumenthal et al., 1989; Dishman, 1994; Petonnet & Szabo, 1993; Rimmel, 2007); resulting in psychological and physiological benefits enabling individuals to more effectively cope with stress (Fleshner, 2005; Taylor, 2000). Conversely, less active or non-active individuals tend to experience more susceptibility to the adverse influences of life stress (Crews & Landers, 1987), increased illness when experiencing negative life events (Brown, 1991), and slower recovery from stressful events (Crews & Landers, 1987).

Stress Response to Physical Activity in the Physical Education (PE) Environment

Physical activity levels, through participation in sports or structured physical activities, and stress levels were investigated in a sample of Norwegian adolescents. Results indicated changes from low physical activity levels to moderate or high levels of physical activity was associated with lower levels of reported stress (Moljord, Moksnes, Ericksen, & Espenes, 2011).

104 Haugland, Wold, & Torsheim, (2003) surveyed adolescents and compared their perceived
105 school-related stress and leisure-time physical activity outside of school. Participants who
106 reported school-related stress were less likely to report health complaints if they participated in
107 leisure physical activities every week.

108 Research has also investigated physical activity on stress in college-aged students.
109 Barney, Benham, & Haslem (2014) investigated college student's perceptions regarding the
110 effects of participation in physical activity courses on life stressors in a sample of 350 college
111 students. Study findings suggested that a college student's participation in physical activity
112 classes helped to mediate life stressors. Specifically, college students felt that participation in
113 physical activity courses helped accomplishing other academic assignments. As well, this sample
114 perceived that college student participation in physical activity helped in better handling of other
115 life stressors.

116 In adolescence, physical activity can be used as the vehicle to better control personal
117 stress. For many adolescents, common life stressors include bullying (O'Neill, 2017), family
118 dynamics (Aherne, 2001), peer influences (Allan & Lawless, 2003), perceived expectations of
119 self and from others (Deutsch & Schwertz, 2011), and difficulty in time management (Gonzalez,
120 Hooper, Lee, & Lin, 2010). Yet, within the school context, physical education classes provide
121 students with opportunities to be physically active; possibly helping to mitigate daily stress. Lang
122 et al. (2016) developed a physical education stress coping program for German speaking
123 vocational students in Switzerland titled Effects of a Physical Education Coping Training
124 (EPHECT). The primary purpose of EPHECT was to foster resilience through the development
125 of an individual and adequate coping repertoire. Physical education teachers in the EPHECT
126 program completed eight modules specific to module implementation into their regular physical

127 education lessons. Students were instructed to perform motor leaning tasks followed by a short
128 reflection moderated by the physical education teacher. Findings suggest implementation of the
129 EPHECT program in PE classes can make positive contributions to help vocational students
130 develop adaptive coping (Puhse & Gerber, 2005).

131 **Physical Activity as a Stressful Event in the Physical Education Environment**

132 Physical activity's role as a stress reduction mechanism has been well documented.
133 However, physical activity as a stressful event in the school and physical education environment
134 has been less established. Little research has addressed physical education in the school
135 environment as producing student stress; as well as ways to decrease its stressful effects (Back,
136 2015; Blankenship, 2013; Currie & Sumich, 2014; Gerber, 2009; Ho, Chiang, & Lin, 2016; Ishii
137 & Osaka, 2010; Lee, Kang, & Kim, 2017). Table 1 presents systematic review findings of studies
138 addressing student exposure to stress in the physical education environment across primary and
139 secondary grade levels.

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141 Insert Table 1 Here
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144 Across all grade levels, Currie and Sumich (2014) outline several strategies in reducing
145 stress and anxiety in physical education, in general. Positive class climate, promoting humanistic
146 values, tolerance, individual expression, student choice, and self-evaluation are suggested for
147 reducing PE stress. Two studies were identified addressing stress and physical education (Back,
148 2015; Lee, Kang, & Kim, 2017). Back (2015) reported a negative correlation between academic
149 stress and school physical education in high school students; with a partial mediating effect
150 between the relationship of attitudes toward physical education and psychological well-being.

151 Lee, Kang, & Kim (2017) reported a correlation between high stress and athlete satisfaction and
152 burnout.

153 Four studies were identified addressing stress in physical education class and junior high
154 school students (6th-9th grades) (Blankenship, 2015; Gerber, 2009; Ho, Chiang, & Lin, 2016;
155 Ishii & Osaka, 2010). Ho, Chiang, & Lin (2016) identified stress in junior high physical
156 education to athletic training and competition; with Ishii & Osaka (2010) identifying exercise in-
157 and-of-itself as a stress-inducing agent. Additionally, Ishii and Osaka (2010) reported that junior
158 high school students who disliked physical education and sport did not benefit from stress-
159 reducing potential of physical education. Gerber (2009), similar to Ishii and Osaka (2010)
160 identified that stressful junior high school physical education experiences negatively impacted
161 positive attitudes towards physical activity and PE. Junior high school physical education
162 experiences leading to increased class stress included: issues with a teacher or classmates,
163 psychological and physical violence, pain or discomfort, poor classroom organization and class
164 structure, and low perceived ability or consistent feelings of failure (Gerber, 2009).

165 A review by Blankenship (2013) addressed several methods, similar to Currie and
166 Sumich (2014) to reduce stress during junior high PE, including: creating developmentally
167 appropriate tasks, private practice sessions, the use of stations, practice sessions, creating a
168 motivational climate, and changing student perceptions of demands and abilities.

169 **Materials and Methods**

170 For this study the salutogenic approach conceptual framework was utilized
171 (Quennerstedt, 2008). The salutogenic conceptual framework is not about what health is, but
172 pays attention to resources in the creation, preservation, and development of health.
173 Quennerstedt stated:

174 Physical activity and movement can be regarded as something more than mere protection
175 against disease or overweight, and by posing salutogenic questions we can enrich our
176 understanding of the relation between physical activity and health, and in consequence
177 richness to the perspective of health in physical education. (p. 277)

178 For the purpose of this study the ‘resources’ was the physical education class. It is
179 implied that physical education class can serve as a way to help students maintain and control
180 their stress. The purpose of this study was to investigate what extent do grade level differences
181 (7th, 8th, and 9th) exist among junior high school students’ perception of participation in physical
182 education class on individual environmental stress.

183 **Participants**

184 For this study, 822 junior high school students (585 males and 287 females) from four
185 intact junior high schools, three from Utah and one from California, were sampled. Student ages
186 ranged 11 to 15 years. Grade levels for all four junior high schools encompassed of 7th, 8th, and
187 9th grades. Stratified by grade level, 315 7th grade students (228 males and 87 females), 281 8th
188 grade students (204 males and 77 females), and 276 9th grade students (153 males and 123
189 females) responded to the survey instrument.

190 **Study Question**

191 1. To what extent do grade level differences exist among junior high school students’
192 perception of participation in physical education class on individual environmental
193 stress?

194 **Instrumentation**

195 Through a review of the literature, investigators did not identify an instrument specific to
196 physical education class and stress related to junior high school students. For this study, a 12-

197 question survey instrument was developed. The survey consisted of six questions with
198 yes/no/sometimes response options (two of six yes/no/sometimes response questions contained
199 qualitative follow-up), three questions with Likert scale response options (1=low; 2=medium;
200 3=high; and 4=very high) (one of the three Likert scale response questions contained qualitative
201 follow-up), and three demographic questions. To establish content validity, junior high aged
202 students reviewed survey questions for clarity and understanding. For reliability, the instrument
203 was pilot-tested on junior-aged students who did not participate in this study.

204 Participants answered questions regarding physical education and stress indices
205 (questions 3-8), self-reported stress levels before and after physical education class (questions 9
206 and 10) , and self-perception of participation in physical education for daily stress management
207 (question 11).

208 **Procedures**

209 Convenience sampling was employed to collect data for this study. Before study
210 implementation, investigators contacted the junior high physical educators explaining both the
211 study and survey. After securing agreement from the physical educators, the researchers had
212 them administer the surveys to their student. Before survey administration, the physical
213 educators explained the study to their students. Prior to data collection, the physical educators
214 were instructed on survey administration. Completion of survey, explanation and administration
215 took approximately 15 minutes.

216 Prior to any survey distribution and data collection, university Institution Review Board
217 (IRB) reviewed study protocol and granted approval to conduct the study. All participants were
218 subsequently assured that their voluntary decision to participate or not participate in the study
219 would not affect their grade in class or class standing. A 98% survey response rate was recorded.

220 The school's classes ran on block schedule, A-day/B-day with class lasting
221 approximately 80 minutes, from bell to bell. Quantitative and qualitative data were analyzed
222 regarding junior high school students' experiences with physical education class and individual
223 stress. Only observed data were used for quantitative and qualitative analyses.

224 **Quantitative Research Design**

225 The study was quasi-experimental mixed-methods design. Data were collected in the
226 form of survey from 872 participants (junior high school students), 585 males (67%) and 287
227 females (33%), enrolled in four junior high schools. Stratified by grade level, 315 7th grade
228 students (228 males and 87 females) ($M = 1.28, SD = .448$), 281 8th grade students (204 males
229 and 77 females) ($M = 1.27, SD = .447$), and 276 9th grade students (153 males and 123 females)
230 ($M = 1.45, SD = .498$) responded to the survey instrument.

231 The following survey questioners were considered for analyses:

- 232 1. *"When I come to this physical education class, I forget about what is stressing me out?"*
233 (question 3)
- 234 2. *"After participating in the class activities, I feel I can handle what is stressing me out?"*
235 (question 5)
- 236 3. *"I look forward to coming to my physical education class?"* (question 6)
- 237 4. *"Rate your stress when you arrive to your physical education class."* (question 9)
- 238 5. *"Rate your stress after you have finished participation in your physical education class."*
239 (question 10)

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241 The response choices given for question 6 were: Yes, No, or Sometimes. The Likert scaling
242 response choices given for questions 9 and 10 were: (1=low; 2=medium; 3=high; and 4=very
243 high)

244 **Quantitative Data Analysis**

245 Analyses were performed on student response data to the survey instrument. Quantitative
246 data analysis consisted of a Pearson's Chi-Squared Tests (χ^2); as well as measures of central
247 tendency and dispersion. Chi-Square Tests were conducted used to compare stress in the physical

248 education environment stratified by grade level and significant effects reported. Chi-Squares,
249 levels of significance ($p < .05$) were reported for all significant effects. SPSS Statistics 21 was
250 used for analyses. Only observed data values were used for these summaries. Significant
251 differences were reported for three (questions 3, 5, 6, 9, and 10) of the nine scaling questions
252 when compared to grade level.

253 A Chi-Square Tests showed that there was a statistically significant difference by grade
254 level in questions related to physical education and stress between grade levels. Question 3
255 *“When I come to this physical education class, I forget about what is stressing me out?”*
256 indicated an association by grade level, with 7th graders ($M = 1.70, SD = .877$), 8th graders ($M =$
257 $1.96, SD = .782$), and 9th graders ($M = 2.02, SD = .903$); $\chi^2 (4, N = 872) = 12.53, p < .01$.
258 Cramer's V effect size was .085, representing a small effect. Students in 7th grade were more
259 likely to forget about stress (37.1%), than 8th (36.5%) and 9th (26.4%) grade students when
260 coming to PE class. (Figure 1) Question 5 *“After participating in the class activities, I feel I can*
261 *handle what is stressing me out?”* indicated an association by grade level, with 7th graders ($M =$
262 $1.66, SD = .856$), 8th graders ($M = 1.92, SD = .772$), and 9th graders ($M = 2.16, SD = .906$); $\chi^2 (4,$
263 $N = 872) = 17.41, p < .01$. Cramer's V effect size was .100, representing a small effect. Students
264 in 7th grade were more likely to respond that they could better handle stress (41.7%), than 8th
265 (31.5%) and 9th (26.9%) grade students after participating in PE class. (Figure 2) For question 6
266 *“I look forward to coming to my physical education class?”* indicated an association by grade
267 level, with 7th graders ($M = 1.50, SD = .838$), 8th graders ($M = 1.40, SD = .805$), and 9th graders
268 ($M = 1.78, SD = .940$); $\chi^2 (4, N = 872) = 25.23, p < .0001$. Cramer's V effect size was .120,
269 representing a small effect. Students in 7th grade were more likely to look forward to coming to
270 their physical education class (38.0%), than 8th (36.5%) and 9th (26.4%). (Figure 3) For question

271 9 “Rate your stress when you arrive to your physical education class.” indicated an association
272 by grade level, with 7th graders ($M = 1.68, SD = .798$), 8th graders ($M = 1.69, SD = .798$), and 9th
273 graders ($M = 1.93, SD = .959$); $\chi^2 (4, N = 872) = 23.54, p < .001$. Cramer's V effect size was
274 .116, representing a small effect. Students in 7th reported lower stress levels before arrival to PE
275 class (38.8%), than 8th (33.3%) and 9th (27.9%). (Figure 4) For question 10 “Rate your stress
276 after you have finished participation in your physical education class.” indicated an association
277 by grade level, with 7th graders ($M = 1.45, SD = .766$), 8th graders ($M = 1.47, SD = .820$), and 9th
278 graders ($M = 1.71, SD = .911$); $\chi^2 (4, N = 872) = 21.04, p < .01$. Cramer's V effect size was .110,
279 representing a small effect. Students in 7th grade also reported lower stress levels after
280 participation in PE class (38.7%), than 8th (34.8%) and 9th (26.5%). (Figure 5)

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305 **Qualitative Follow-Up Data Analysis**

306 Additional data results were comprised of short-answer responses from the study
307 participants. Thematic analysis and findings reported for 4 of the 12 survey questions (questions
308 4, 7, 8, and 11). Participants were asked to explain and expound their responses to the four open-
309 ended questions. Thematic content analysis performed on open-ended responses. Referencing
310 qualitative analysis, researchers read and re-read content until common themes became evident
311 for each survey question. Responses were first examined using inductive content analysis
312 (Lincoln & Guba, 1985 & Sarvela & McDermott, 1983) in order to identify emerging themes. A
313 constant comparative method (Glasser and Strauss, 1967) was employed, first to categorize then
314 compare and contrast each unit of information with all other units of information with the intent
315 of linking those with similar meanings (Patton, 2002).

316 Participants answered questions regarding stress indices: stress after completion of
317 physical education class (question 4), stress reduction after participation in physical education
318 class (question 7), stress from participation in physical education class (question 8), and
319 participation in physical education class in managing life stressors (question 11). Analysis
320 revealed three major themes: (a) stress mitigation from physical education, (b) social bonding
321 from physical education, and (c) PE classmates as negative stress in physical education. (Figure
322 6)

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327 **Stress Mitigation After Participation in the Physical Education Environment.**

328 Participant responses focused on the mitigation of stress after participating in physical education:
329 “Sometimes I forget about my stress, often doing fun things in PE.”, “Yes, because I think
330 physical activity is healthy and when I run or do physical activities, it helps get my mind off
331 things and is like therapy.”, “When I have fun I forget about the things that stress me.”,
332 “Running makes me calm.”, and, “After working out, my brain is empty and refreshed and ready
333 for the next class.”

334 **Social Bonding as Stress Reduction in the Physical Education Environment.**

335 Referencing social bonding as a stress reducer, responses included: “Because I can talk to
336 friends, and physical activity can help me forget about stress.”, “I get to hang out with my friends
337 and talk to them about life.”, and “I talk to my friends and play sports.”

338 One minor theme that arose from was, for stress reduction during class, stress reduction
339 in PE was contingent on activity type. Statements included: “If I enjoy the activity and get into
340 what’s happening during PE, it occasionally takes my mind off of my stress.”, and “Depends on
341 what we do in PE class.”

342 **Classmates as Negative Stress in the Physical Education Environment.** Conversely,
343 to the major theme of social bonding, participant responses focused on classmates as producing
344 stress in the physical education environment: “Classmates are too much.”, “I don’t like some
345 kids in my class.”, and concise responses such as “Bullies!”

346 **Discussion**

347 The purpose of this study was to explore grade level differences (7th, 8th, and 9th)
348 among junior high school students’ perception of participation in physical education class on
349 individual environmental stress. Findings suggest PE class helped junior high school students

350 with stress in their lives, particularly among 7th grade students. In general, 7th graders were more
351 likely to respond they could better handle stress after participating in PE class, looked forward to
352 coming to their physical education, reported lower stress levels before arrival to PE class, and
353 reported lower stress levels after participation in PE class, than 8th and 9th graders. Overall,
354 follow-up qualitative findings also helps support quantitative results. For reference, when
355 students left PE class they felt their participation in class activities helped them “be more calm”,
356 “distracted me from my worries” and helped get “their mind off things.” Moljord et al. (2011)
357 studied the relations of physical activity, stress, and happiness in a sample of Norwegian
358 adolescents, 13 to 18 years old. Moljord et al. (2011) reported adolescents with moderate or high
359 physical activity levels reported lower stress and higher happiness than adolescents with lower
360 physical activity levels.

361 Another point of discussion references participants expressing their feelings and thoughts
362 in regards to PE class helping them lessen stress experienced from daily stress. Sharp and Barney
363 (2016) studied the effects of stress in college students attending a university that did not require
364 physical activity classes for graduation compared to students attending a university requiring
365 students to take physical activity classes for graduation. Students participating in physical
366 activity classes recorded the following statements, “I still have stress, but physical activity
367 helps”, “I would be more cranky and restless without it”, “I feel I am in a better mood and can
368 handle situations better”, and “It relieves my stress and problems so I can encounter them.”
369 Finds parallel with previous research, while adding to the literature supporting one potential
370 beneficial mechanism for adolescents to address stress.

371 One of the main goals of physical education is to make activities and games fun and
372 enjoyable (NASPE, 2009). Yet, historically physical educators have used inappropriate

373 instructional practices in activities and games that have not been fun and enjoyable for students.
374 Thus, possibly creating or adding stress for the student. Barney, Pleban, Fullmer, Griffiths,
375 Higginson, & Whaley (2016) studied exercise as punishment in physical education class and its
376 effects on former students' attitudes. Participants were interviewed about their past PE
377 experiences and the use of exercise as punishment. Participants were asked, "Was the overall
378 classroom environment affected when students had to exercise as punishment?" Overwhelming,
379 participants reported "yes", the classroom environment was negatively affected. Additional
380 statements included, "The atmosphere usually became tense", "It's awkward to watch", "It
381 scares the group or makes them feel uneasy", and "It made us fear the teacher." Student
382 responses do not specifically address stress from exercise and punishment, yet the responses
383 alluded to the notion that these experiences did not create a positive learning environment.

384 **Implications for Physical Education Teacher Education Programs**

385 The salutogenic conceptual framework states, "understanding of the relation between
386 physical activity and health and in consequence richness to the perspectives of health in physical
387 education" (Quennerstedt, 2008). After data and thematic content analyses, junior high school
388 students participating in PE class tend to report better stress management. Another implication
389 from this study is that PE teachers should be mindful of activities students can participate in that
390 will be most beneficial in helping students relieve stress in their lives. Table 2 outlines Physical
391 Education Teacher Education Program guidelines and their proposed associated effects on
392 student stress in the physical education environment.

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398 Additionally, Pangrazi and Beighle (2013) suggested when students enter class they should be
399 engaged in activity; with active teacher interaction.

400 One last implication of this study that Physical Education Teacher Education (PETE)
401 faculty should be mindful of their preparing PETE majors and that benefits that can come to their
402 students through participation in class activities thus resulting in managing stress in their lives.
403 When the PETE major graduates and teaches their own classes, they can use this information to
404 better inform parents, administrators, and the classroom teachers the benefits of student's activity
405 in PE class and throughout the student's life.

406 **Study Limitations**

407 Investigators have noted certain limitations to this study. Four junior high schools from
408 two states participated in this study. The four junior high schools in this study were from two
409 states. Because the participants came from certain locales and grade levels, it may not allow a
410 representative sampling of participants from other schools, grade levels, or in other geographic
411 regions, thus limiting the generalizing of the findings. Thus, themes, conclusions, and
412 implications are mostly applicable to those participant demographics. Research on refining
413 physical education teacher education and the physical education environment needs to be
414 continued in new meaningful directions. Physical education teacher education research should
415 continue incorporate diverse investigation methodology in order to better examine the
416 environmental factors in the physical education environment (Hassandra, Goudas, & Chroni,
417 2003). In order to identify more robust causal relationships between stress and physical activity,
418 a longitudinal study design would be needed.

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Junior High PE and Stress[Type here]

Table 1
Student exposure to stress in the physical education environment across primary and secondary grade levels

Title	Author(s)	Publication Date	Study Country	Study Design	Grade Level/Age	Sample Size	Assessment Method	Outcome(s)
Changes in Satisfaction with Physical Education and Intrinsic Sport Motivation as a Function of Chronic Stress Experiences in Physical Education Classes	Gerber	2009	Switzerland	Cross-sectional	Junior High (6 th to 9 th grade)	302 boys & girls	Survey	<ol style="list-style-type: none"> 1. Stress negatively affected intrinsic motivation & contributed to reduced PE satisfaction levels. 2. Stressful experiences in PE impacted positive attitudes towards physical activity & PE: <ul style="list-style-type: none"> • problems with teacher or classmates • psychological & physical violence • pain during or after PE • poor organization & class structure • low perceived ability or consistent feelings of failure.
Physical Education and the Degree of Stress	Ishii & Osaka	2010	Japan	Cross-sectional	Junior High	268 (129 boys, 139 girls)	Survey	<ol style="list-style-type: none"> 1. Students who disliked physical education & sports did not benefit from stress-reducing potential of exercise & sport. 2. Exercise may be stress-inducing agent.
The Stress Process in Physical Education	Blankenship	2013	USA	Review	7 th grade	N/A	N/A	<ol style="list-style-type: none"> 1. Reducing stress during PE: <ul style="list-style-type: none"> • Create developmentally appropriate tasks • Arrange private practice sessions • Use stations • Maximize practice • Create a task-involved motivational climate • Identify students with low perceived competence/high trait anxiety

Junior High PE and Stress[Type here]

								<ul style="list-style-type: none"> • Change student perceptions of demands & abilities • Teach relaxation techniques.
Creating Stress-Free Learning Environments for Sport and Physical Education	Currie & Sumich	2014	Australia	Review	All Grades / Non Identified	N/A	N/A	<ol style="list-style-type: none"> 1. Reducing anxiety in PE: <ul style="list-style-type: none"> • Ensure positive class climate with zero-tolerance for bullying • Promote humanistic values • Build tolerance • Encourage free, creative, individual expression • Establish 80% success rate to build confidence • Allow student choice or offer activities rated high enjoyment • Permit students to self-evaluate & measure results.
The Mediating Effects of Hope Between Attitude Toward School Physical Education, Academic Stress, Ego-Resilience, and Psychological Wellbeing of High School Students	Back	2015	Korea	Cross-sectional	High School (ages 14 to 18 years)	780*	Survey	<ol style="list-style-type: none"> 1. Positive correlation toward school PE: attitude toward school physical education, academic stress, ego-resilience, & psychological well-being. 2. Negative correlation toward school PE: academic stress. 3. A partial mediating effect between youth attitude toward school PE & academic stress, ego-resilience, & psychological well-being.
A Study on Relation Between Stress and Coping Strategies of Junior High School Students in the Physical Education Programs	Ho, Chiang, & Lin	2016	Taiwan	Cross-sectional	Junior High	589 boys & girls	Survey	<ol style="list-style-type: none"> 1. Junior high student stress in PE related to PE athletic training & competition. 2. Significant differences in gender, grade, competition level, sports, & experience

Junior High PE and Stress[Type here]

								been in physical education programs. Positive correlation between stress identification & application of coping strategy.
Relationships Among Stress, Burnout, Athletic Identity, and Athlete Satisfaction in Students at Korea's Physical Education High Schools: Validating Differences Between Pathways According to Ego Resilience	Lee, Kang, & Kim	2017	Korea	Cross-sectional	High School	332 (225 boys & 107 girls)	survey	1. High stress correlated with burnout & high levels of burnout negatively related to athletic identity & athlete satisfaction.

Note. N/A = Not Applicable.

*Gender not identified.

Table 2
Physical Education Teacher Education Program Guidelines Impacting Stress in the Physical Education Environment

Stress Promoting Experiences in Physical Education	Stress Mitigating Experiences in Physical Education
<ul style="list-style-type: none"> • Problems with teacher or classmates. • Psychological & physical violence. • Pain during or after PE. • Poor organization & class structure. • Low perceived ability or consistent feelings of failure. (Gerber, 2009) 	<ul style="list-style-type: none"> • Create developmentally appropriate tasks. • Arrange private & maximize practice sessions. • Use of stations. • Create a task-involved motivational climate. • Encourage free, creative, individual expression • Ensure positive class climate with zero-tolerance for bullying. • Identify students with low perceived competence/high trait anxiety. • Establish 80% success rate to build confidence. • Allow student choice or offer activities rated high enjoyment • Change student perceptions of demands & abilities. • Permit students to self-evaluate & measure results. • Teach relaxation techniques. • Promote humanistic values. <ol style="list-style-type: none"> 1. Build tolerance. (Blankenship, 2013; Currie & Sumich, 2014)

Figure 1. Response Rates by Grade Level for Question 3

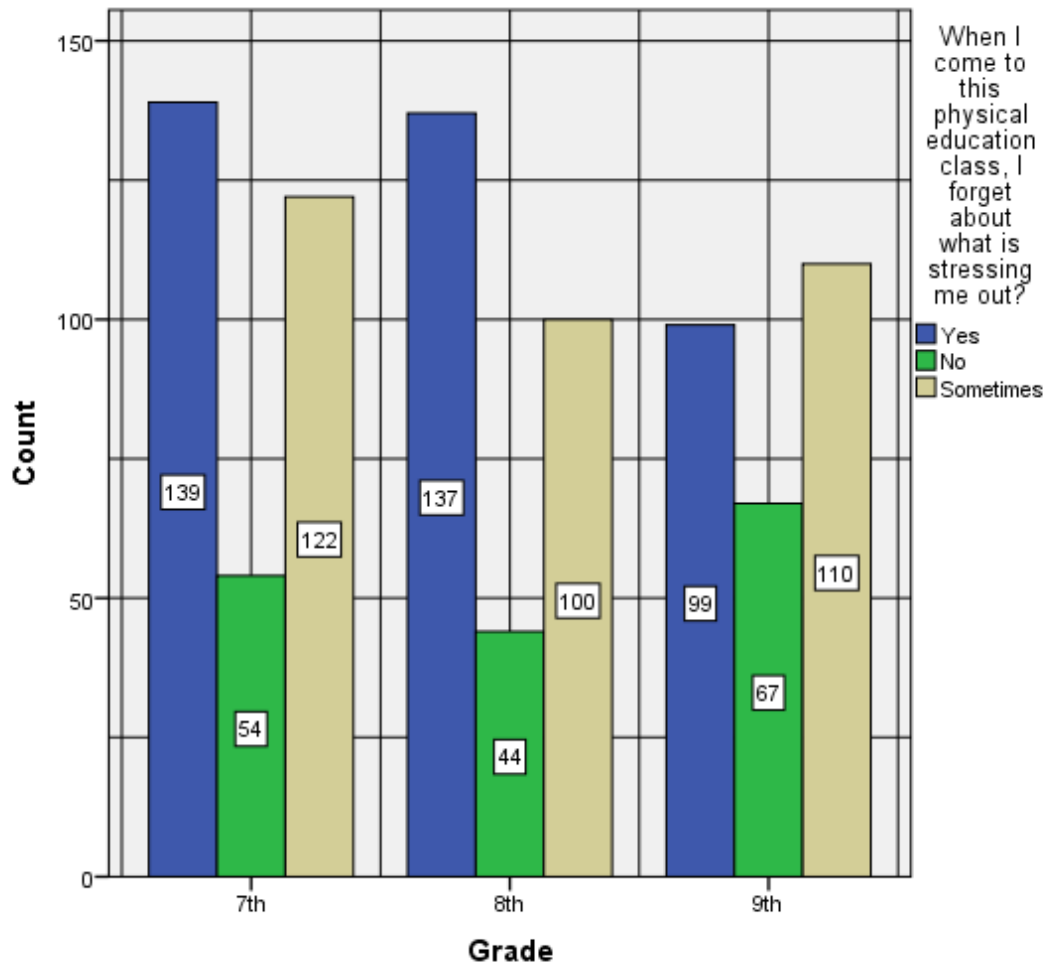


Figure 2. Response Rates by Grade Level for Question 5

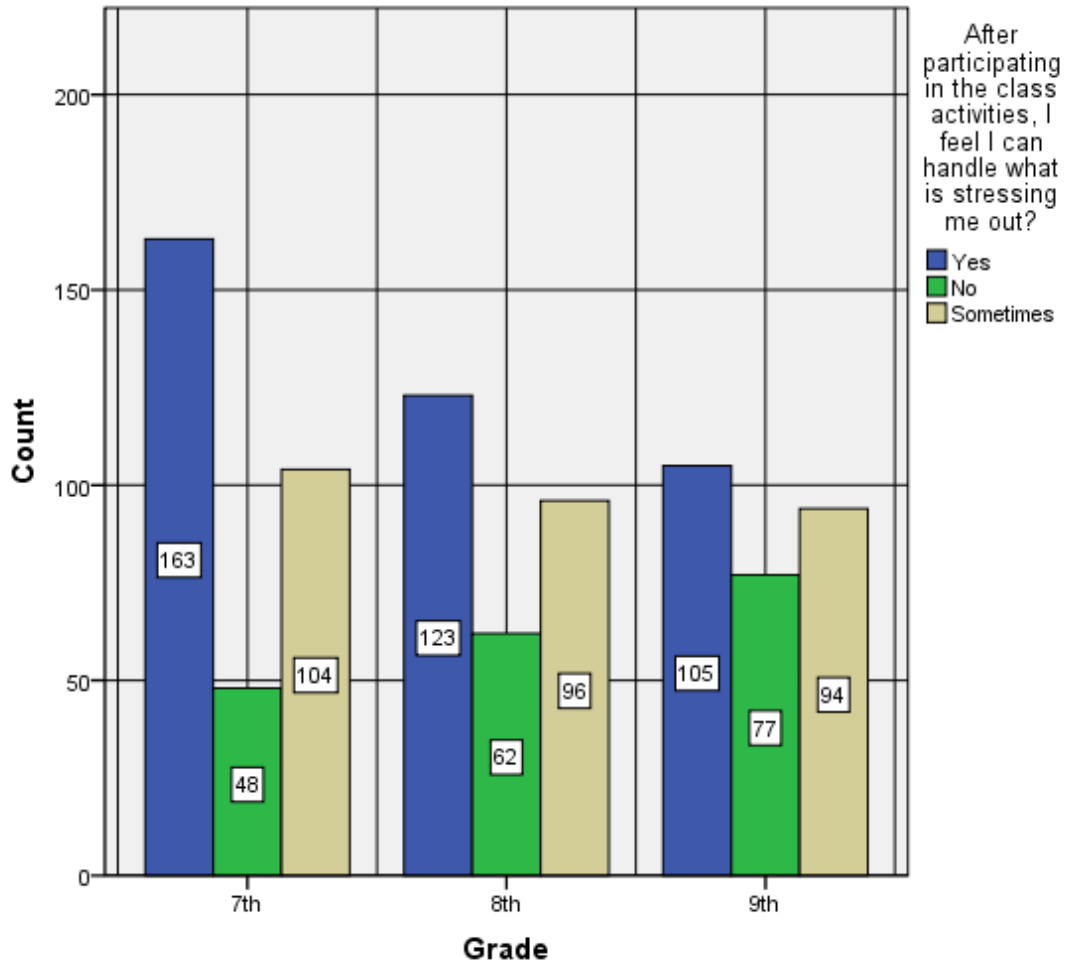


Figure 3. Response Rates by Grade Level for Question 6

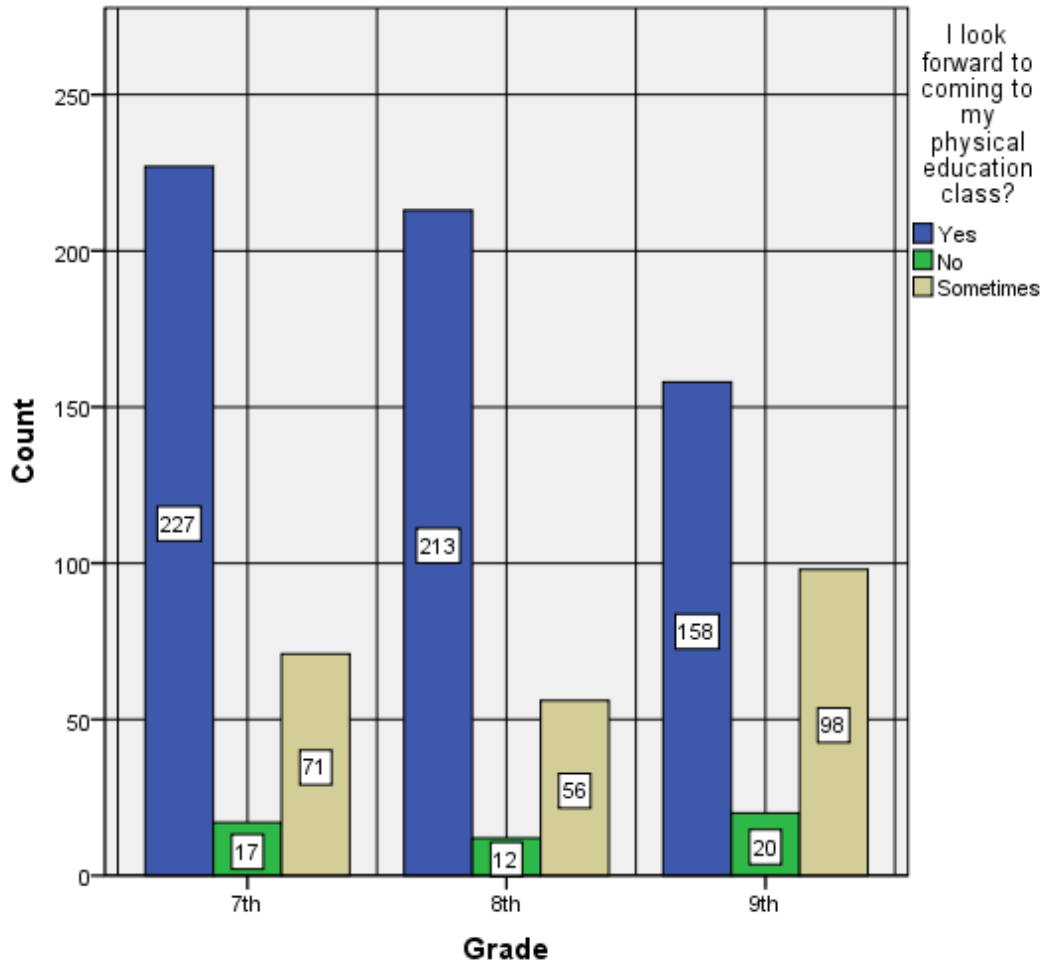


Figure 4. Response Rates by Grade Level for Question 9

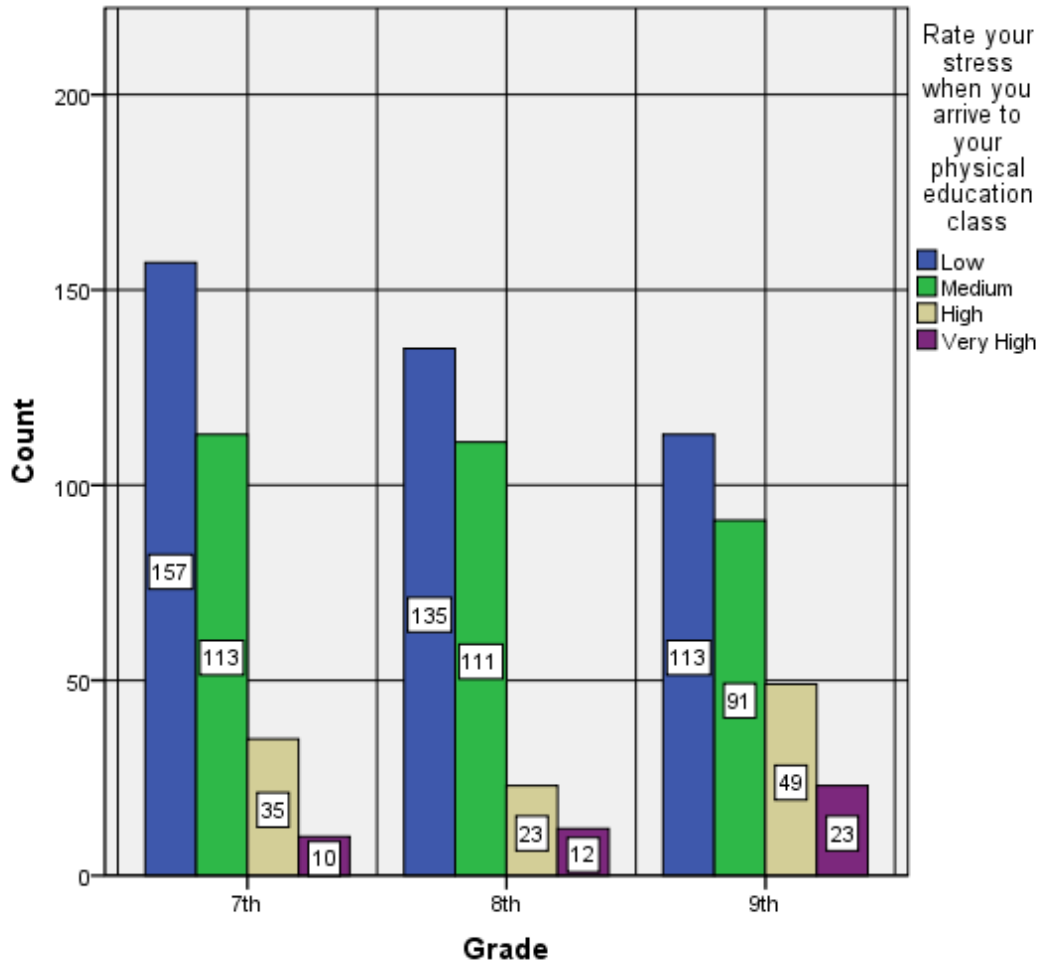


Figure 5. Response Rates by Grade Level for Question 10

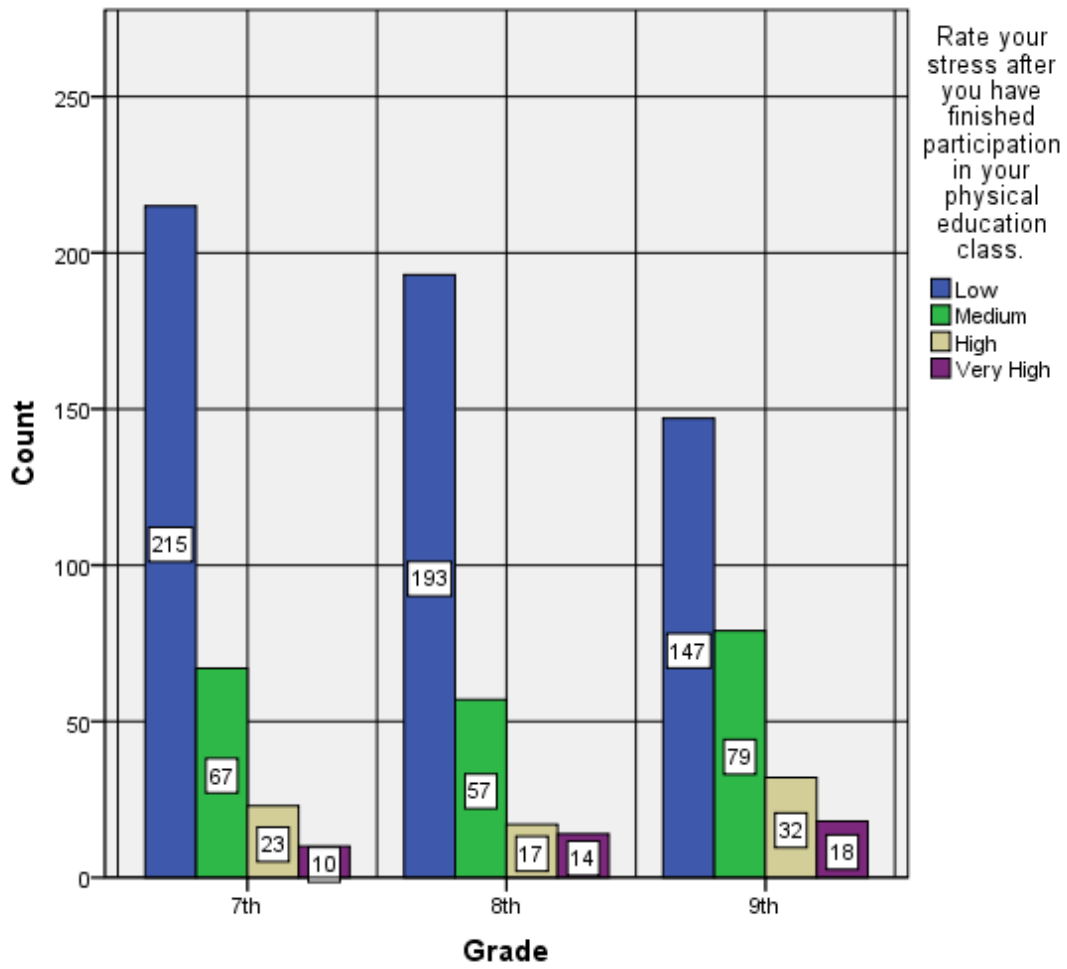


Figure 6. Stress in Physical Education: Major and Minor Themes

