PE2GO: Program Evaluation of a Physical Activity Program in Elementary Schools

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**Background:** PE2GO is a self-contained physical education (PE) program that provides classroom teachers with the tools they need to lead developmentally appropriate PE lessons. The purpose of this study was to evaluate the PE2GO pilot programs in 6 school districts across the United States. **Methods:** We used paper and pencil surveys at pre intervention (n = 114) and mid intervention (n = 94) and an electronic survey at post intervention (n = 65). In addition an electronic survey was sent to administrators at preintervention (n = 18); focus groups were conducted with teachers at mid intervention for a broader perspective. The study took place September 2004 through May 2005. **Results:** Results indicate that teachers were satisfied with the PE2GO program and the perceived effects it had on their students. Teachers reported that students increased their time engaged in physical activity (128.7–181.1 minutes per week pre-to-post intervention). Administrator support was important (ie, associated with improvement), but not always present. **Conclusion:** In conclusion, the PE2GO program holds promise for the concept of providing in-class physical activity opportunities for students. **Keywords:** physical education, physical activity, curriculum, children, youth

Regular physical activity during childhood and adolescence provides an array of health benefits, both physical and psychological.1–3 Because schools have the potential to provide opportunities for physical activity to well over 90% of the children in the United States, physical education (PE) in schools has an important role in public health.4 In this era of budgetary shortages affecting public schools, it has become essential to find ways to deliver affordable PE and other opportunities for physical activity to children through a variety of means. It is also important to promote lifetime physical activity that will be carried on outside of school and throughout life.

With the recent decline in available adult supervision and a perceived lack of safe outlets for physical activity, children have traded traditionally active outdoor play for less active indoor endeavors. For example, a national study has shown that children today spend an average of 3.6 hours per day using electronic media (TV, computers, video or DVD, video games).5 An increase in such sedentary activities is thought to contribute to the burgeoning obesity epidemic,6 and subsequent chronic disease ramifications.

Schools can provide resources and space for a safe and well-supervised environment in which children can be physically active. Traditionally, recess and PE classes were included in the daily schedule for that purpose. Today, however, only about 1 in 3 adolescents attend PE class daily,7 and almost 30% of elementary students do not have regular recess sessions.8 With current trends emphasizing academic improvement and initiatives such as the “No Child Left Behind” program, school administrators and teachers face increasing pressure to do whatever is possible to improve student achievement. Student achievement (or lack thereof) is not only connected to school funding, but carries severe sanctions that can place educators’ jobs in jeopardy and, in extreme cases, threatens school closings. Given recent widespread declines in academic achievement in recent years, the stakes for improved academic achievement are understandably higher than ever before. In reaction to this and other pressures, such as overcrowding, safety concerns, and teacher shortages, administrators are forced to make tough decisions about what will be supported and what is omitted from the whole school curriculum. Anecdotally, some educators’ attitudes about student welfare have become primarily achievement score driven. In the words of one administrator who participated in this study, “If it doesn’t show substantial promise for immediate improvement in our standardized test scores, it will not be part of our curriculum.”

Several strategies are typically used to improve standardized test scores. Popular among them is simply to spend more time teaching customarily tested subject areas such as mathematics, science, social studies, and English language skills, reading and writing. In such circumstances, PE class is often a casualty. Yet studies have shown that time devoted to PE does not interfere with academic achievement and may even enhance
achievement;\textsuperscript{9,10} and physical fitness has been shown to correlate positively with passing standardized academic tests in English and mathematics.\textsuperscript{11} A recent review study reports that adding up to an hour per day of curricular time to physical activity programs does not affect academic performance even though the time allocated to other subjects shows a reduction; and emphasis on PE may result in gains in grade point average.\textsuperscript{12} Daily attendance in PE dropped from 42\% to 25\% among high school students between 1991 and 1995 and has remained unchanged for years.\textsuperscript{7} Moreover, a possible unintended consequence of decreasing physical activity in schools is an associated decline in life satisfaction and self-esteem.\textsuperscript{13}

Nike Incorporated designed PE2GO in partnership with Sports, Play, and Active Recreation for Kids, (SPARK)\textsuperscript{14} as a short-term solution to the problem of decreased physical activity among students. The program is designed to be infused into subject areas in the students’ regular classroom curriculum. It has several goals, including increasing the physical activity level of participating students, increasing students’ enjoyment of physical activity, and increasing understanding of the factors that support physical activity in the school setting. The longer-term aim of Nike and SPARK is to increase the amount of high quality physical activity provided to students by training classroom teachers in physical activity in the classroom—not to replace specially trained PE specialists (ie, those certified in PE) since studies have shown that PE specialists provide the highest quantity and quality of PE.\textsuperscript{2,15,16} Though there is evidence that classroom-based programs can improve both physical activity,\textsuperscript{17,18} and on-task behavior,\textsuperscript{19} the purpose of this study was to evaluate the PE2GO pilot program by assessing its feasibility as indicated by staff’s comfort level with the delivery of curricula, satisfaction of the program, perceived benefits and barriers, as well as their estimation of time students spent engaged in physical activity during the school day.

Methods

The Program

Nike and SPARK designed PE2GO to provide physical activity curricula, training, and equipment to 4th and 5th grade public school classrooms whose PE classes and other opportunities for physical activity had been reduced or eliminated. The program included: a customized curriculum designed to meet the needs of 4th and 5th grade classroom teachers for delivering PE, 2 expert customized hands-on staff training workshops to improve physical activity programs in the schools, assistance with instructional alignment to state/national standards, site-specific assessment of barriers to physical activity quantity and quality, and equipment with a retail value of $10,000 per school.

Participants

The pilot program reached some 6000 elementary school students as recruited by the funder (Nike) across 6 U.S. cities (Portland, Oregon; Akron, Ohio; New York, New York; Chicago, Illinois; Los Angeles, California; and Memphis, Tennessee). The initial cost was about $13 per student. The study population consisted of the faculty and administrators at the schools where the curricula were implemented; this group included, classroom teachers (N = 114), PE specialists (N = 19), and school level administrators (N = 18).

Procedures

Nike and SPARK recruited school districts in large urban centers; schools within the districts were selected by the school district administrators on the basis of several criteria, such as limited access to regular PE, an ethnically mixed student population (at higher risk of overweight), and organizational capacity (ie, supportive administration, human and physical resources). Once the schools were selected, SPARK staff contacted each school administrator and arranged the initial contact with 4th and 5th grade classroom teachers. A school level needs assessment was conducted during the winter of 2002 to 2003 to better understand the current environment of the schools’ physical activity programs and gather participant views on what would constitute valuable teacher training workshops. Due to the variation in district configuration, size and classroom make-up/size, as well as teacher willingness, a building level administrator (usually principals) agreed to provide at least 4 classroom teachers per building the opportunity to participate in 2 in-service training workshops and offer additional support for the implementation of the programming. Classroom teachers voluntarily agreed to participate in the 2 in-service training workshops directed by SPARK personnel, and to implement the subject matter and protocol as part of their regular academic day. In schools where a PE specialist was employed, he or she acted in an advisory role and agreed to help with resources and provide technical assistance. In such cases, the aim of PE2GO was to supplement the minutes of physical activity already provided by the PE specialist (ie, increase frequency of PE sessions to at least 3 times per week).

In-service days were set aside for the purpose of training those teachers in the fall of 2003 and in the early months of 2004. Experienced trainers from the SPARK staff conducted 2 1-day training workshops using a “playbook” created for the PE2GO program. Nike provided each teacher with a playbook and each school with enough equipment so that every child in participating classrooms had access to all the equipment needed to be fully engaged in the activity. The first training workshop focused on the themes “building a foundation” and “disguising fitness.” The workshop provided teachers with hands-on practice and adequate opportunities to establish some comfort as well as increase teachers’ ability to implement the activities in their own classrooms. The second training workshop, which took place about 4 months later, focused on the theme “simplifying sports.” Both workshops provided instruction on the important pedagogical skills necessary for classroom teachers to conduct effective PE sessions.
Data Collection

Data collection for the evaluation of the PE2GO pilot program was conducted in 3 distinct phases: pre intervention, mid intervention, and post intervention. Evaluation consultants independent from Nike or SPARK conducted all aspects of the data collection and analyses.

Phase 1. Phase 1 was designed to gather pre intervention data and contact information (including e-mail addresses) to be used in later inquiry. At the outset of the first PE2GO training workshop, a trained evaluator administered the paper-and-pencil survey instrument to all participants. The evaluator explained to participants that their input was essential for the success and improvement of the program and that there would be additional surveys later. The preintervention survey instrument was developed with several functions in mind: 1) to gather descriptive information (eg, intervention site, grade level taught), 2) to measure participants’ satisfaction on 8 dimensions of the current physical activity curriculum on a 5-point Likert scale, 3) to assess 8 possible barriers to adequate physical activity as suggested by the needs assessment also on a 5-point Likert scale (see Table 1), 4) to assess any previous training(s) in PE, and 5) to estimate, by teacher report, the amount of time students currently spent engaged in physical activity. One hundred and fourteen classroom teachers and 19 PE specialists responded. Also during Phase 1, a link to a brief electronic survey was e-mailed to the administrators of the corresponding schools to assess their support of the program, in terms of both their motivation and their commitment to providing resources (see Table 2). Eighteen principals responded, representing a 29% response rate. The psychometric properties of the surveys instrument were not determined.

Phase 2. Phase 2, a midintervention measure, using the same survey as in Phase 1, was designed to quantify differences in satisfaction, barriers, and time students spent engaged in physical activity. The survey was administered by paper and pencil at the end of the second SPARK training; there were 94 classroom teachers (82%) and 14 PE specialists (73%) who responded. In addition, a qualitative inquiry was conducted in focus groups facilitated by trained focus group leaders with previously recruited groups of 4 to 8 people from each school district who had attended both trainings and implemented the PE2GO program in their classrooms between training workshops. One focus group was conducted per school district (N = 6). The focus group sessions were tape-recorded and transcribed for analysis.

The data collected through the focus groups were used to gain corroboration with quantitative data collected in Phases 1 and 2 as well as help understand the “whys.” Participants were asked to describe 1) what they believed to be among the best features of the program; 2) the actions and attitudes of the children during a typical PE2GO session; 3) how they knew whether the PE2GO program was effective; 4) how the PE2GO program affected the total number of minutes that kids were active during the school week; 5) any evidence of how well received the program had been with the context of their school’s overall curricula; 6) what general or

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Satisfaction and Barrier Scales (Measured on 5-point Likert Scale)</th>
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<tbody>
<tr>
<td><strong>Satisfaction</strong></td>
<td></td>
</tr>
<tr>
<td>Fitness</td>
<td>Student physical fitness is increasing</td>
</tr>
<tr>
<td>Skill</td>
<td>Student sport and movement skills are improving</td>
</tr>
<tr>
<td>Sports preparation</td>
<td>Students are preparing for participation in youth sports</td>
</tr>
<tr>
<td>Lifetime physical activity</td>
<td>Students are learning physical activities that can be used for a lifetime</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>Students are enjoying being active</td>
</tr>
<tr>
<td>Self-image</td>
<td>Students are developing a positive self-image and self-confidence</td>
</tr>
<tr>
<td>Cooperation</td>
<td>Students are learning to cooperate with others and improve social skills</td>
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<tr>
<td>Recess</td>
<td>Student activity is carrying over to recess and lunch breaks</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Physical activity takes time away from academic subjects</td>
</tr>
<tr>
<td>Equipment</td>
<td>Physical activity requires equipment for each child</td>
</tr>
<tr>
<td>Preparation</td>
<td>Physical activity requires me to prepare an additional subject</td>
</tr>
<tr>
<td>Space</td>
<td>Physical activity requires safe space for physical activities</td>
</tr>
<tr>
<td>Coordination</td>
<td>Physical activity requires school and facilities schedules to be coordinated</td>
</tr>
<tr>
<td>Training</td>
<td>Physical activity requires special training for classroom teachers</td>
</tr>
<tr>
<td>Admin.</td>
<td>Physical activity requires administrative commitment</td>
</tr>
<tr>
<td>Comfort</td>
<td>I do not feel comfortable leading physical activity</td>
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specific barriers could they identify or speculate on that may need to be addressed to make the program most successful; 7) how their own attitude about delivering instruction on physical activity instruction had changed; 8) what they believed was needed to support further use (or the sustainability) of PE2GO.

**Phase 3.** Phase 3 was conducted toward the end of the school year, after teachers had been exposed to both training workshops and had ample time to practice and implement the program. The survey was designed to measure the sustainability of any gains or losses in areas of inquiry covered for Phases 1 and 2. Given that there was no opportunity to deliver the survey in-person, the postintervention measure employed an electronic survey e-mailed to all participants, which was followed-up with 2 e-mail reminders. All “undeliverable” messages (n = 11) were followed up with a telephone call to clarify their e-mail address. The effort yielded a net response rate of 52% for classroom teachers (N = 65) and PE specialists (n = 8) for Phase 3.

**Statistical Analyses**

Descriptive statistics were computed to characterize survey responses regarding (1) the amount of physical activity students engaged in, (2) teachers’ satisfaction with the PE2GO program, (3) barriers to implementation, and (4) administrators’ perspectives and teachers’ perspectives of the administrators’ and the PE specialists’ roles. Ninety-five percent confidence intervals were calculated to assess significant changes over time. Quotations from focus groups are used below to characterize the majority of responses or to add emphasis.

An “improvement score” was computed based on the teachers’ changes in responses over time in rating their satisfaction with the PE2GO program and the number of minutes reported for students’ physical activity per week. The improvement score was determined by adding the change in satisfaction scores (0–40 points across the 8 5-point Likert items; eg, a score of 40 would indicate that the responder was “very dissatisfied” on all 8 measures on the first survey) and the change in minutes of physical activity (categorized as −5 to +5 with 0 representing no increase, −5 representing at least a 45 minute decrease, and +5 indicating at least a 45 minute increase). Hence, the highest possible improvement score was 45 (40 + 5). Pearson’s correlation coefficients were calculated to estimate the relationship between the improvement score and (1) teachers experience before in-service training workshops, (2) administrators’ commitment to providing resources, and (3) administrators’ support (motivation and resources) of the program.

**Results**

**Teachers’ Perspective**

**Satisfaction With PE2GO.** On all 8 questions assessing teachers’ satisfaction scores increased significantly from pre to mid intervention (P < .05) and remained elevated post intervention (see Figure 1). From the qualitative data, we noted that for most focus group respondents, their confidence in teaching physical activity increased.

> “Now I’m excited to teach PE and that affects the kids so they’re more excited too.”

Some remarked that they had also learned about their students in the process.

> “It made me focus on all kids’ needs—not just the athletic ones.”

In addition, some teachers lauded the program’s ease of implementation, the high degree of student cooperation, and the variety of equipment provided for the program.

> “I needed the equipment.”

Overall, a weak correlation was observed between the level of inexperience of teachers and the improvement score (r = .20). However, when one school district was excluded (ie, the district that showed no increase in improvement score), the correlation was much stronger (r...
Thus it appears that teachers who had less familiarity with PE experienced the greatest improvement in the 8 areas surveyed.

Regarding the teachers’ perceptions of the program’s effect on students, all focus group respondents reported that students asked for the program, and almost all said they could see their students having fun. Most groups noticed an increase in cooperation among students and they noted fewer arguments between students during and outside of class. Some groups noticed that more children were taking leadership roles and fewer children were afraid to participate.

“You see the ones that kind of start off slow, and then the next time they do a little more.”

Some also noticed that cooperation increased in the classroom.

“...You see the ones that kind of start off slow, and then the next time they do a little more.”

Barriers to Implementation. Of the 8 questions that addressed barriers, scores on 4 decreased significantly from pre to mid intervention ($P < .05$) and retained these reductions at post intervention (see Figure 2). From the qualitative data, we noted that almost all focus groups indicated that administrative coordination and/or coordination with the PE department were barriers.

“We teachers were told, not asked, if we wanted to attend, while the gym teacher was not asked to attend the training. This poses a problem because the gym teacher needs to be involved in such a program.”

Half of the groups said that a shortage of time was an obstacle, especially during academic testing periods.

Figure 1 — Mean Satisfaction Score (Likert scale: 1 = very dissatisfied; 5 = very satisfied) on 8 Items Related to PE2GO Programming on Pre, Mid, and Post-Intervention Surveys. b.) Significantly different from pre-intervention survey ($P < .05$).

Figure 2 — Mean Barrier Score (Likert scale: 1 = not at all a barrier; 5 = insurmountable) on 8 Items Related to PE2GO Programming on Pre, Mid, and Post-Intervention Surveys. b.) Significantly different from pre-intervention survey ($P < .05$).
Half of the groups had difficulty with logistical issues, such as equipment management and storage, indoor space constraints, and winter weather. Two of the six groups thought that inadequate training was a barrier. In addition, some mentioned that follow-ups with Nike and SPARK for guidance and mentoring would be helpful. Finally, 2 mentioned safety as an issue of concern.

**Quantity of Physical Activity.** The teachers report of number of minutes of physical activity per week increased significantly from the preintervention survey to midintervention survey (128.7 ± 89.6 minutes vs. 163.5 ± 132.5 minutes) and remained higher than preintervention value at the posttest (181.1 ± 92.1 minutes). Of the 6 school districts, 3 showed substantial increases, 2 showed smaller increases, and 1 showed no increase. According to the qualitative data, most focus group respondents reported that time spent in physical activity approximately doubled for their students. The remaining groups reported that the program provided some activity, whereas without PE2GO almost none would have been available.

“Without PE2GO there would be no activity for the kids. Because of the weather there has been little recess, but the PE2GO has given them movement where they wouldn’t have it before.”

**Sustainability.** When asked, 100% of respondents said they would recommend PE2GO to others. All focus groups reported that the program was inclusive, involving all students, and all groups indicated that the students enjoyed the sessions.

“It’s fun for children who are very athletic, as well as those who are intimidated by sports and are not as athletic.”

In half of the focus groups, participants liked that it encouraged children to socialize with a variety of their peers.

“I noticed the couple of quiet ones, who like to be alone and to themselves. With these activities they are getting out and opening up a lot more… the other kids pull them in.”

Almost all groups commented that the lessons were easy to follow, and half of the groups noted also that the playbook was clear and well organized. Most focus group participants said that they would “love to do it again.”

When probed about how to boost the program’s sustainability, almost all responded that they needed more training. Most said that they needed more administrative support and some encouraged more participation from the PE department as a matter of school culture. Half responded that more parental support would help. In addition, half of the groups mentioned a need for funding, and half responded that they would like to include more grade levels in the program. Some groups mentioned a need for more staff, and some groups cited a need for more space.

**Administrators’ Perspectives and Teachers’ Perspectives of the Administrators’ and PE Specialists’ Roles.** When teachers in focus groups were asked about support from administrators, almost all responded that administrators had expressed support for the program, yet about half of the groups added that administrators had little actual involvement.

“I haven’t had one conversation about it with them [the administrators].”

Regarding PE specialists, about half of the focus groups reported that the PE department was supportive; however, others said that the PE department was uninvolved. One group reported conflict with the PE specialist.

There was a significant correlation ($r = .76, P < .05$) between administrators’ commitment to providing resources and the improvement score and between the administrators’ motivation score and the improvement score ($r = .62, P < .05$).

**Discussion**

PE2GO was designed to infuse physical activity into the classroom hours of 4th and 5th graders to supplement the activity dose provided by the PE specialist if one existed. The program showed promise in achieving this goal according to both quantitative and qualitative data gathered from teachers. As with earlier studies of SPARK curricula and training, we found that PE2GO led to a greater amount of physical activity. Although not all classroom teachers are inclined to teach physical education, quality training, support, and resources (both curricular and equipment) can increase teachers’ confidence and skill in providing physical activity opportunities for their students. Excerpts from a letter received from one of the teachers summed it up best:

I just finished the school year and wanted to take a moment to tell you HOW MUCH I LEARNED and ENJOYED working with the PE2GO program with my students.

I was able to complete almost every activity in the 5th grade playbook during this school year. I was fortunate in that I had a gym available to me on Friday afternoons. My students could hardly wait until 1:50 on Friday to learn a new activity. You must remember that I am no spring chicken...nor have I ever taught PE classes. I never played any sports as a kid...in fact, I NEVER BLEW A WHISTLE until I worked with PE2 GO!!! Talk about leaving your comfort zone!!!! Still, I thought the program was sooo valuable, I loved learning from the SPARK
trainers (what an inspiration he is!), and I recognized the need for more physical exercise for children, especially some seriously overweight students in my class. So, I went full speed ahead, from October’s training, right through to the last week of school, teaching my students new physical education activities. Despite my lack of background, the kids were just great. There was constant movement, full participation, and lots of carry-over.

I also learned a lot about my students. I saw kids in a completely different setting . . . away from academics of the classroom. . . . I saw who the strategists were, who had well-developed skills, and who didn’t; I saw kids working together and having fun; I saw teamwork develop and encouragement galore. I saw everyone having some element of success. And, best of all, I saw this carry over back into the instructional classroom. My students learned to work better in teams in the classroom. They developed an “I can” attitude in challenging subjects, confidence was raised. Kids were happier. It was an unbelievably positive experience for me and the children.

I have a whole new respect for teachers who teach Physical Education . . . . It is so much more than playtime or a planning period for regular classroom teachers. Thank you for bringing this opportunity to us. I had a great time learning and growing and doing these activities with my students. I look forward to continuing PE2GO with my next group of students in the fall.

—Teacher, 5th grade

Given this teacher’s account and the strong inverse correlation observed between experience and improvement, we speculate that participants with the least experience in PE will experience the greatest improvement in satisfaction with the PE2GO program, and hence will likely engage their students in the greatest amount of time devoted to physical activity. Other studies have reported that ongoing, supportive professional development can substantially improve classroom teachers’ physical education programs.15,19

Clearly, support from administrators for a program such as PE2GO is essential as they have the ability to cut or fund physical activity programs in their schools. Hence it is necessary to advocate for PE and other opportunities for physical activity in schools. At least 1 classroom-based physical activity program has been designed to integrate curricular elements,18 which should make obtaining support easier. Furthermore, the evidence is growing that PE, fitness, and physical activity may actually improve academics.9–12 We found that administrator support, as indicated by their commitment to resources and motivation, was a strong indicator of program success as measured by teacher satisfaction.

Teachers reported that the students were better behaved in the classroom and that discipline problems were reduced as compared with before implementation of PE2GO. As others have speculated, it could be that the break afforded by PE sessions improved the student’s attention.20 Another explanation is that neurological or hormonal changes that result from physical activity alter arousal, which can improve attention.21 To date, no studies have suggested that time dedicated to physical activity for students hurts academic performance,9 and a study in California suggested that physically fit students actually performed better on academic achievement tests.22

While the cost of the PE2GO program, $13 per student, may be a barrier to implementation, it must be noted that this start-up cost and included formative research and development and distribution of PE equipment. Continuation costs would be much lower, and the benefits, as suggested by our preliminary analysis of the program’s pilot, would greatly outweigh the costs.

This study has several limitations. First, there was no control or comparison group. Instead changes were measured over time in relation to baseline data collected before PE2GO’s implementation. Second, the improvement score was based on teachers’ perspectives only. It would be useful to have more objective measures and to collect data on student-level variables. In addition, we were unable to obtain sufficient data from PE specialists on the survey to include in the analyses, so their perspectives remain unknown in this study. Though they were invited to attend the 2 trainings, few did.

Conclusions

Based on quantitative and qualitative data collected from teachers, it appears that the PE2GO program is feasible to implement in the classroom setting during the school day. Teachers are satisfied with the program, they report increased physical activity levels for the students, and they report that students seemed to enjoy the activity. Enjoyment is a key factor related to engagement23 and may foster lifelong participation. There appeared to be carry-over into other subjects and aspects of the students’ school time. The majority of teachers found the materials easy to use and helpful. Administrative support is crucial to the success of the program, and PE specialists as mentors and consultants could have an important role in program success. Finally, continued training for teachers is desirable.

This program evaluation of PE2GO’s pilot phase enabled its creators to make appropriate program improvements (eg, engaging school PE specialist in a more prominent role, and providing ongoing follow-up) so that the program can maximize its contribution to public health through the school setting.
Acknowledgments

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References


