

**PEACEFUL PLAYGROUNDS: A PROGRAM TO REDUCE PLAYGROUND  
INJURIES IN SCHOOL SETTINGS**

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**ABSTRACT**

This six-year longitudinal study evaluated how the adoption and operation of the Peaceful Playground Program <sup>TM</sup> can significantly reduce playground injuries. The site for this study was a K-5 elementary school in Murrieta, California. While substantial sums of money have been allocated and utilized for the purpose of ‘constructing’ safer playgrounds in California’s schools, the current literature does not report that a subsequent reduction in injuries has occurred. A program designed and implemented at E. Hale Curran Elementary School in Murrieta, however, has proven to significantly reduce injuries while at the same time dramatically reducing the incidence of rule infractions and misbehavior. Where previous efforts to reduce injuries have focused on but one aspect of the playground environment – construction – the program evaluated in this study addressed a number of the components that the authors believe are necessary in the establishing of a safer play environment.

This study is of particular relevance to school administrators, school board members, teachers, playground supervisors, concerned parents, school maintenance personnel, as well as insurance agents who insure schools against liability claims resulting from playground injuries. In December 1999, E. Hale Curran Elementary School received the prestigious Golden Bell Award for excellence in the implementation of a program that greatly affects the lives of students in the California school environment. The implementation of the Peaceful Playgrounds Program and the ongoing commitment to continued staff development in the Peaceful Playgrounds principles lead to both the significant results presented in this study and the receiving of the prestigious Golden Bell Award.

## INTRODUCTION

*“Serious injuries that happen on school grounds and result in hospitalization have not been well studied in the United States.”*

– Children’s Safety Network, 1997

Playgrounds help children develop physically, emotionally, socially and intellectually (The National Program for Playground Safety, 1996). They also offer children the opportunity to learn problem-solving skills, to explore, to manipulate items, and to discover new ways to get on and off equipment. If we fail to provide developmentally appropriate experiences for children during the early formative years, we are likely to retard or inhibit the acquisition of motor and perceptual skills and abilities in later life (Wortham, 1990 p.148-149). As perceptual-motor development proceeds, children develop an increased capacity for handling more complex quantities of sensory input. Thus, curriculum objectives that focus on visual and auditory perception, space orientation, tactile experience, kinesthetic awareness, and motor skills development are believed to build learning skills and strengthen learning potential in young children (Wortham, 1990 – p. 152). This position, affirmed by Bruya & Langendorfer (1988 p.115), stipulates that enhanced perceptual functioning can be crucial to steady improvement in cognitive and motor development. Play leads to discovery, verbal judgment and reasoning and it is important in developing manipulative skills, imaginative art, discovery, reasoning and thought. It improves problem solving, enhances language development, and enhances group cooperation (Bruya, 1988 p.10-11). In addition, the interaction-based feedback in play between peers and adults influences growth on various social, cognitive, and academic measures (Wortham, 1990 – p. 168).

However, these positive benefits of play and playgrounds can be negated if the play environment presents potential injury risks to children. Injuries on playgrounds account for well over a majority all unintentional injuries that occur in the school setting (Hudson, Olsen and Thompson, 2002). According to the Children’s Safety Network (1997) 80% of all elementary school children in the United States will see a school nurse for injury-related complaints and yet the problem of injuries in the school environment often still goes unrecognized. Consequently, preventative measures continue to be neglected (Children’s Safety Network, 1997). Where steps have been taken in an attempt to decrease the number and/or severity of injuries received on school playgrounds, subsequent follow-up with determination of program effectiveness and the recommended frequency of continued maintenance efforts have been rare or nonexistent. Currently, the most common step taken by schools attempting to provide a safer school environment is focused on the play structure and fall surface areas of the school playground. While substantial sums of money have been allocated and utilized for the purpose of achieving a safer playground through replacing play structures and upgrading the surfacing in California schools, the current literature is virtually devoid of studies which support the effectiveness of the re-constructing and resurfacing efforts as leading to a reduction of injuries. As reported by Bruya & Langendorfer (1988, 223-225) “even after 20 years of advocating for the installation of appropriate surfacing materials under playground

equipment, the results of the National Survey of Elementary School playgrounds are discouraging. ...The use of safety surfacing will not completely eliminate accidents.” Furthermore, they argue that, “Playgrounds with safety surfaces stimulate strikingly different play patterns by children than occur over hard surfaces. Children engage in more risk taking behavior with safety surfaces in place, and are generally more expansive and relaxed in their movements.”

According to the Children’s Safety Network (1997) each year an estimated 1 in 14 children suffers a medically treated injury at school. These injuries annually result in \$3.2 billion in medical expenditures and nearly \$89 billion in good health lost. Injuries received on the playground can result in school absences for children and missed work for parents. In some cases these injuries can be quite life threatening. Speaker Villaraigosa, quoting Assembly Bill 1055, reminds us that each year 20,000 children in California and 200,000 children nationwide receive injuries on playgrounds that are serious enough to send them to the doctor or hospital (California Assembly Bill 1055, 2000). About 15 children each year die from these playground injuries (CPSC, 2000). This is even more alarming when we consider that in 1974, approximately 118,000 persons in the United States – almost the current numbers – received hospital emergency room treatment for injuries related to playground equipment with 75% of these injuries having been received by children under 10 years of age (CPSC, 1975).

When considering this almost two-fold increase, CPSC literature offers two issues that demand consideration. First, playgrounds that are designed, installed, and maintained in accordance with safety guidelines and standards can still present hazards to children in the absence of proper supervision. Furthermore, the quality of the supervision depends on the quality of the supervisor’s knowledge of safe play behavior. The second issue they present is the inadequate maintenance of equipment, which is increasingly resulting in injuries on playgrounds.

That school playgrounds receive poor supervision is not surprising when one considers Bruya’s (1988 p.22) concerns that “Public school administrators and teachers receive little or no formal training about play and child development and hold play in low regard.” Bruya (1988 p.121) warns that, “a carefully designed and well-organized process (for playground safety) must be undertaken to secure committed teacher involvement.” This is extremely important in light of the fact that 40% of all injuries have been attributed to a lack of adequate supervision (The National Program for Playground Safety, 1996).

Playground equipment like any other facility on the playground must receive on-going maintenance. Wooden structures splinter and rot, plastic equipment can crack and produce jagged edges, and metal frames rust. Swing chains become worn, bolts and nuts become loose and various equipment parts can get broken. In addition, loose fill surfacing materials under and around playground equipment displace, migrate, compress, or disappear over time. All of these items, if not attended to can raise the probability of an unintentional injury occurring. Yet, in light of budget cutbacks, playground maintenance has a low priority.

The problem becomes, then, of how to promote the benefits of play in the school setting while reducing the probability of unintentional injury.

### **Intervention**

To address the concern about the increasing number of playground-related injuries, growing in, the Peaceful Playgrounds Program was developed in 1998. Peaceful Playgrounds is an anti-violence program created by Cal State San Marcos education professor Melinda Bossenmeyer, that aims to topple the centuries-old Darwinian pecking order of the schoolyard while providing students with an enhanced and inviting play space. The result is active children, fewer injuries, and fewer playground conflicts. Bossenmeyer maintains the problem with most schoolyards is that there is not enough for all the kids to do, so they run around disrupting the games of others and generally get into trouble or else they hang around the fringes or sit idle. Because public schools may not have the money to buy more playground equipment or hire more supervisors, Bossenmeyer approaches the dilemma with low-tech, low-cost comprehensive method to get the children moving again, but playing nice.

Whereas other playground safety programs typically address only one aspect (construction/equipment), the Peaceful Playground Program utilizes a multi-faceted approach to playground safety. The Program consists of five main components that make up the program's CREED. Creed stands for Conflict Resolution, Rules, Expectations, Equipment, and Designs.

- a. **Conflict Resolution** -Unlike the typical playground where students request the playground supervisor to settle disputes, students employing the Peaceful Playgrounds strategy learn that they can be successful at problem solving both in and out of school. More importantly, it frees supervisors to do what they do best, which is to look after the safety of all the children on the playground.
- b. **Rules** - Rules and procedures define, establish, and maintain the orderly playground environment. The Peaceful Playgrounds program emphasizes two types of rules. These are 1) rules that governing safe play and an orderly environment and 2) game rules that outline how a game is to be played including the designation of when a game is deemed ended such that other children may have their turn. 3) Consistent set of game rules is established and taught to all students.
- c. **Expectations.** The program was implemented school-wide to insure consistent expectations and success. The program outlined the importance of each staff member being trained so that they could support the objectives of the program. Additionally they were expected to enforce the agreed upon rules and procedures.

- d. **Equipment.** Playground equipment was divided into two areas, 1) consumable equipment such as balls, bean bags, scoops, etc. and 2) play structures, which are often referred to as ‘playground equipment’. Game area markings and rules mean nothing without ample and proper consumable equipment. The Peaceful Playgrounds program suggests the “1-10 rule”. Accordingly, it was expected that for each 10 children on the playground at least one piece of equipment was to be available. The program is also based on the implementation of routine maintenance of structures, and weekly checks to see that surfacing materials such as wood chips are distributed evenly and not pushed away from equipment due to usage.
- e. **Design.** The design of program activities is consistent with the CPSC recommendation that age-appropriate playground designs should accommodate the differences in child development with regard to the type, scale and layout of play structures and playground markings. Accordingly, the Program’s designs provided playground differentiations for age and developmental levels. Game markings include: 4 square, basketball courts, freeze out court, alpha bet grid to name a few.

The purpose of this study was to determine if it is possible to decrease playground unintentional injuries as a result of the impact of the implementation of PP at one school site over a three-year period.

## METHODOLOGY

### Description of School Site and Student Population

This study was conducted at E. Hale Curran elementary School in Murrieta California, a suburb of Southern California. The school is a K-5 public school on a multi-track year-round school schedule with approximately 75% of the students on campus at any one time during the school year. Students receive 180 days of instruction, with breaks spread out over the school year, which runs from July 1 to June 30<sup>th</sup>.

During the course of the six-year data collection period, the school served between 600 and 1,200 students annually. The student body maintained a fairly consistent ethnic composition that was 71% Caucasian, 19% Hispanic, 8% Asian, and 2% African American. In the fall of 1993 the school experienced a student mobility rate of 22.4%. Three percent of the students are English learners, 14% of the students qualify for free or reduced lunches, and 12% of the students receive special education services, which include a county severely handicapped program and a preschool special day class

program. The school, which has experienced a unique steady growth pattern, is in one of the fastest growing school districts in California.

In 1992, E. Hale Curran Elementary School staff began to consider their options to provide their students with a well-rounded and thorough educational experience, while faced with a rising student population and ever-increasing incidences of injuries on the school's playground. The school was three years old in 1992 and its playground featured all of the typical courts and games: hopscotch, tetherball, baseball diamonds, volleyball courts, slides, swings and climbing apparatus. In 1992, only 34% of the total 29 playground accidents resulted in visits to the doctor. By 1994, the total injuries had risen to 50, with 48% serious enough to warrant a doctor's attention.

From 1992 through the 1994 school year, the school population grew at an annual rate of 23% to 33%. In 1995, the year that the Peaceful Playgrounds Program was implemented, the school's population increased a full 23% over the previous year. The population decrease in the 1996 school years was a result of the opening of a new school to which many students were relocated. In 1997, the student population return to a growth pattern consistent with, though not as dramatic as, pre-1996 growth rates.

### **Data Collection**

This study focused on injuries occurring specifically during the recess and lunch periods, times in which unstructured play takes place on the playground. During these daily-allocated time periods, children engage in 20 minutes of unstructured play once per day in the morning at a designated outdoor playground area and 40 minutes of unstructured play once per day in the same area during the noon lunch break. The recess/lunch periods were supervised by 3 paraprofessionals, who were all regular part-time employees of the school.

It is important to note the distinction between structured and unstructured play. Structured play is generally regarded as that play which typically occurs during a formal instructional class such as physical education. Extracurricular activities that involve play that is guided by formal instruction may also be considered as structured play. Unstructured play is that play in which children engage without the direct and continuing instruction of an adult. It is during periods of unstructured play that children engage in activities that facilitate their growth in the areas of socialization, morality, fantasy, creativity, and decision making. Only injuries occurring during periods of unstructured play were included during this study. That is to say, injuries that occurred during physical education class and extracurricular physical education sessions have not been included.

The school health clerk maintained school incident reports that documented all incidences of injury (due to either accidents and/or rule infractions/misbehavior). These reports were subsequently collected from the school health clerk for the purpose of evaluating injury patterns over the six-year period from July 1, 1992 through June 30, 1998.

In this study, the following information was collected: Type and quantity of injuries, cause of injury (e.g., due to a fall), the location of the injury to the body, the result of the injury (treatment in nurse's office versus physician referral), time of day the injury occurred, grade level of the injured child, and the breakdown of injuries based on sex. Type and quantity of injuries were of particular interest to the authors. They were defined as:

- ◆ **Total Injuries (TI)** – All documented incidents in which a child received injuries on the playground during the recess/lunch periods as determined by an incident report filed by school personnel.
- ◆ **Serious Injuries (SI)** – A documented incident in which a child received injuries on the playground during the recess/lunch periods that warranted summoning the paramedics or referring the injured child to seek greater medical attention than schools may provide. Examples include: “referred (Michael’s) parents to their family doctor (due to) laceration...” and “referred (James’) parents to their family dentist (due to) injury to mouth that unseated braces from rear molar...” and “paramedics called... Alex transported to hospital (due to) injury to back...”
- ◆ **Major Injuries (MI)** – a document incident in which the child received injuries on the playground during the recess/lunch periods that resulted in hospitalization, a laceration requiring stitches, a broken bone requiring a cast, or injuries that kept the child from attending school for greater than two days. Examples include: “...Sarah’s upper arm was broken...she will return to school in a couple of days”, “...Erin needed five stitches for cut on (left) eyebrow...”, “...(Susan) has perforated spleen & bruised kidney...will be hospitalized 2 days approximately...will be at home at least 1 week more...”.
- ◆ **Minor Injuries** – a document incident in which the child received injuries on the playground during the recess/lunch periods that resulted in minor treatment in the nurses office and then child returned to class. Examples include: “...Jimmy fell and skinned knee...cleansed area and applied bandage and student returned to class.”

In order to better understand the cause of the incident, school staff also documented whether the injury was accidental or due to a violation of established school rules or engaging in misbehavior. Rule Infractions (RIs) were determined in one of two ways on the Student Injury Form. First, the form has a specific field denoted as: “Did the injured violate any school rules?” Second, there were also notations in injury report narratives of violations of school rules that are included. Examples of these include: “...(Melissa was) running under parallel bars (and) hit head...”, “...(Joey was) pushed by another student while climbing up ladder to slide...”, “...(Josh was) wrestling, fell and hit head...”.

Injury incident reports were organized into two categories: (1) those that occurred on the playground during the unstructured play periods, and (2) all other reports (which were excluded from the study).

For the purpose of this study, the “playground” was defined as – the area designated for children to engage in unstructured play during recesses. The area was divided into two



separate and distinct play areas. One area was designated for children in kindergarten, and one area was designated for grades one through five. Each area includes one designated and marked hard surface blacktop area, one designated grassy area and one metal and plastic play structure area with exercise bars, slides, swings, and climbing bars. An injury report that stated “*Playground, Playground Field, Tetherball Courts, etc...*” in the document field “Where did accident occur?” will have been included in the study evaluation, while one that stated “*Near Classroom, Outside Classroom, Near the Bathrooms, In Classroom, Getting off bus, Lunchroom, etc...*” will not have been included.

## Results

School population and injury data are presented in Table 1 below. Over a six year period, the school’s population increased from 600 in 1992 to 1,225 in 1998. One possible explanation for the increase in the number of injuries during the study period is that dramatic increases in student enrollment may have contributed to playground overcrowding, leading to a higher incidence of injuries. However, although both the total enrollment and number of injuries from 1992 to 1994 increased, the injury rate (number of injuries/total population) remained stable at about 5%. Further, the school’s population reached its highest level (n=1,225) the first year of the Peaceful Playground implementation. In this first year of implementation, the injury rate decreased by more than half to 2%, while the school population increased 19%.

Also notable is the decrease in injuries across all injury categories (serious, major and minor) for the three year period following the implementation of Peaceful Playgrounds. The incidence of rule violations also decreased dramatically following the implementation of the program. From 1992 to 1994, 2% of all injuries were caused by rule infractions. Following the implementation of the program, the total number of rule infractions decreased, and in 1996 and 1997, less than 1% of injuries were related to rule violations.

|  | <b>Baseline</b> |            |            | <b>After PP Implementation</b> |            |            |
|--|-----------------|------------|------------|--------------------------------|------------|------------|
|  | 1992            | 1993       | 1994       | 1995                           | 1996       | 1997       |
| Total Injury Rate<br>(total injuries/school<br>population) | <b>.05</b>      | <b>.05</b> | <b>.05</b> | <b>.02</b>                     | <b>.01</b> | <b>.01</b> |
| School Population  | 660             | 800        | 1,000      | 1,225                          | 770        | 1,088      |
| Total Injuries   | 32              | 38         | 50         | 26                             | 11         | 9          |
| Major Injuries   | 16              | 14         | 14         | 10                             | 7          | 1          |
| Serious Injuries   | 9               | 11         | 22         | 11                             | 4          | 5          |

|   |                      |             |             |            |             |             |
|---|----------------------|-------------|-------------|------------|-------------|-------------|
| Minor Injuries  | 7                    | 13          | 14          | 5          | 0           | 3           |
| Rule Infractions<br>(may include any of the<br>above 3 types of injuries) | 11<br>rate:<br>(.02) | 14<br>(.02) | 18<br>(.02) | 7<br>(.01) | 3<br>(.004) | 3<br>(.003) |

To test the hypothesis that the Peaceful Playgrounds program reduces injury rates, a statistical test was performed on the sample data. The injury data were organized into proportions of the total number of children that were injured during three years prior to program implementation (average proportion of population injured between 1992 and 1994 = 0.05, n = 1,560) and during the three years post implementation (average proportion of population injured between 1992 and 1994 = 0.01, n = 3,083).

| Year      | Proportion Injured | Average Enrollment |
|-----------|--------------------|--------------------|
| 1992-1994 | 0.05               | 820                |
| 1995-1997 | 0.01               | 1,027              |

A chi-square test of differences between two proportions was conducted. A chi-square test was selected because the data are nominal in nature and the samples were sufficiently large to calculate the variance among the observations and assume that under the null hypothesis the variance had a chi-square distribution. The test result revealed a significantly lower injury proportion in the post-implementation group (Chi-square = 24.69,  $p < .049$ ). It appears that Peaceful Playgrounds dramatically improved playground safety, resulting in significant reduction of injuries and rule violations during the three-year implementation period.

The authors considered other possible factors that may have contributed to the changes observed. The factors listed below were ruled out as possible explanations for the decrease in injury rates.

- (a) Population Change. In evaluating the effect of population change on this study, it was found that injuries appeared to follow in correlation with population growth. However, in 1995, total subjects increased and achieved its greatest population (P=1,200) while that same year saw the greatest decrease in injuries within all of the categories observed. The following year, 1996, showed a decrease in enrollment, however the injury rate did not reflect an increase (as would be the case if there were an inverse effect relationship between Population and Injuries). Neither did it remain constant (either in *actual* number or as a function of 'proportion of population'). In fact, Total Injuries continued to decrease at a rate disproportionate to the change that would be expected as a function of Population Change.
- (b) Personnel Change – There was no change to the personnel responsible for completing or maintaining Injury Reports during the six-years that the data were collected.

- (c) Procedures for Reporting Injuries – neither the procedures for filing nor maintaining reports changed during the six years the data were collected.
- (d) Replaced Falling Services – while this is a recommend component of the Peaceful Playgrounds Program, the authors considered the potential impact of this singular component to be no more significant than other fall surface installations. Future research will need to consider this component in more detail.

## DISCUSSION

The program implemented at E. Hale Curran Elementary School in Murrieta, California significantly reduced injuries and the incidence of playground conflict and rule infractions. The authors believe that five factors attributed to the dramatic results achieved at this school.

First, the game markings were laid out such that children were distributed evenly across the play areas. Since there were no congested areas, there was no unrest due to overcrowding and children were much less likely to run into each other resulting in falls and injuries. Also, children had many more options for games to play and spent less time standing around, getting frustrated, waiting for a turn at play. Indeed, the program added upwards to one hundred new games to this schools playground. Following Peaceful Playgrounds implementation, the school’s principal, David Koltovich, remarked, “Ninety-five percent of the students are actively engaged in play, while the few others take time under the shade to eat their snacks.”

Second, students were instructed in the proper use of all equipment. For example, injury reports showed that several injuries resulted from the improper use of the horizontal ladders, which are commonly referred to as “monkey bars.” Two basic rules found in the Peaceful Playgrounds Program made a substantial difference: Hands must be the last thing to leave the bars, and nothing but the chin is ever allowed above the horizontal bars.

Third, the school implemented the Peaceful Playgrounds Program school-wide and conducted in-service training for all staff with playground supervisory duties. School administrators also made certain that any new teachers or staff with playground supervisory duties were trained, provided with copies of game rules, and understood the components of the program, thereby maintaining consistency. Furthermore, no staff members undermined the conflict resolution component by unduly interfering in non-threatening or non-aggressive conflict. Also, game rules were posted on the playground and all of the children received instruction that included experiential practice so that they came to know the rules very well.

Fourth, staff supervising the playground made certain that all children were instructed in and followed the correct process of conflict resolution. Additionally, the fact that playground supervisors did not intercede in disputes that were being properly resolved, led the students to believe in the process and adhere to its rules.

Fifth, the school incorporated in its annual budget funds to replenish consumable equipment such as balls, hoops, and ropes. Site administrators also made an allowance for refurbishing equipment as it ages and refreshing the playground as necessary so that it is always a fun and inviting place for the school's children and the community at large.

While the five components of the CREED guide a school's implementation of the Program, one can see that the overall success of the Peaceful Playground program can be attributed to its comprehensive approach to unintentional injury reduction. While earlier studies indicated that this could be best accomplished by replacing surfacing and play structures this study indicates that an equally or perhaps even more compelling influence is the human element – that of training students, teachers and staff on, rules, procedures and expectancies for safe play. In short, while surfacing and structures help to insure that serious injuries decrease, it is the people on the playground that have the greatest impact on the reduction in office referrals and injuries as a whole.

The Peaceful Playground program was initially created to promote peace, cooperation, education and safety. This study of the implementation of the program documents the dramatic reductions in all types of injuries and rule violations that occurred over a three year period. It is not surprising that over 7,000 schools nationwide and many schools internationally are in various stages of implementing the program.

The authors are continuing to follow E. Hale Curran Elementary School's progress and will in future be conducting studies at other sites. Much more research is needed in this very important area of child development and playground safety. The authors hope that this article will lead to the further research and development of programs that are designed and implemented to protect children in the United States' public and private schools.

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## Appendix

### Appendix 1. Safety Rules, Peaceful Playground Workshop Handout

1. Be Kind.
2. Share
3. Take Turns
4. Telling Not Tattling
5. Play safety on equipment.
6. Nothing but head and hands above any bar.
7. Use Walk, Talk, & Rock, Paper, Scissors or to solve problems
8. Freeze at the bell.