REPORTED CAUSES OF ACCIDENTS AMONG PRE-SCHOOL CHILDREN IN WESTLANDS DIVISION OF NAIROBI PROVINCE, KENYA

BY

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THIS RESEARCH THESIS IS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF EDUCATION (EARLY CHILDHOOD) DEGREE OF KENYATTA UNIVERSITY

AUGUST 2005

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

This work is dedicated to God's glory! My beloved: parents Wamaitha and Mwithiga; dear husband Mugo, children Liz, Ken, Jackie, Victor, Evelyn; grand children: Levina, Damien; sisters, brothers and friends without whom the completion of this study would have been very difficult.
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ABSTRACT

Accidents affect children's total health negatively and therefore have led to the declaration of safety as a basic right to children worldwide. In Britain however, studies on school accidents show that approximately 700 children of mixed ages died yearly due to causes such as falls and cuts from various objects. In U.S.A. about 4.5 million school children aged 10 to 17 years, sustained such injuries as cuts, swellings and fractures in 1988 while in Egypt, 72.6% were injured in school and 27.4% elsewhere. The above global studies show a high occurrence of accidents to children in school but are not in the Kenyan context. In Kenya, information on children's accidents was available but systematic studies on school injuries let alone their causes were scanty and the available ones mainly on home accidents and fire related cases in some boarding secondary schools. In a bid to minimize accidents to children in school, the Kenyan government has stipulated safety guidelines for observation in all schools, but despite the efforts, accidents to pre-schoolers continue to persist as was noted in some local hospitals. A systematic study on causes of accidents among children in pre-schools was therefore necessary.

The purpose of the study was to establish the causes of accidents among young children in Kenyan schools and particularly pre-schools in Westlands Division, of Nairobi Province. The division was selected randomly after Nairobi province had been purposively selected. The study was based on the Domino theory of industrial accident prevention adapted to suit school context using ex-post facto research design. Random selection of 56 (30%) schools from 187 was initially done then 131 (30%) teachers from 437 as well as 351 parents from 3011. The 131 teachers and 351 parents were evenly distributed among the 56 pre-schools giving 112 teachers and 336 parents from whom two teachers and six parents per pre-school were randomly selected.
to respond to oral interviews and written questionnaires respectively. The sample sizes were adequate in descriptive research. The split half technique was used for reliability testing of instruments and 0.9 co-efficient from teachers' data obtained and 0.7 from parents. Data were analysed both qualitatively and quantitatively. Qualitative analysis involved describing and explaining the information on accidents and their causes. Quantitative analysis was employed to summarize data using frequency tables, percentages and graphs. One-way ANOVA was used to test all the five hypotheses.

The results of the study show consistency with the Domino Theory that human error and specifically children's rough play/indiscipline were the greatest contributors of accidents in pre-schools followed by inadequate supervision. Poor condition of play facilities and their wrong use, as well as the poor condition of classroom learning facilities and their wrong use were next. It is therefore recommended that pre-school managers and teachers should keenly supervise children to curb down children's rough play/indiscipline, teach safe practices in children, and ensure availability of safe learning environment as well as play environment.
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Abbreviations and Acronyms

Abbreviations

O.A.U.: Organisation of African Union
K.I.E.: Kenya Institute of Education
G.o.K.: Government of Kenya
K.M.A: Kenya Medical Association
N.H.S.S.P: National Health Sector Strategic Plan
V.A.S.: The Voluntary Aid Societies

Acronyms

UNICEF: United Nations Children’s Fund
DICECE: District Centre for Early Childhood Education
NACECE: National Centre for Early Childhood Education
M.o.E.S.T.: Ministry of Education, Science and Technology
CHAPTER ONE
INTRODUCTION

1.1 Background to the Problem

A school is an institution where not less than 10 pupils receive regular instruction and are gathered for the purpose of learning (G.O.K., 1980), and needs to do so in a safe atmosphere in order to avoid accidental injuries. According to G.O.K. and UNICEF (1994), accidents hamper children’s holistic growth and development. Accidents also undermine the government’s efforts in achieving its aim to promote and improve the health status of the entire Kenyan population including children as desired in the National Health Sector Strategic Plan (N.H.S.S.P.) of 1999 to 2004 (G.O.K., 1999). Accidents not only inflict physical pain to children but they could also lead to illness as well as socio-emotional distress (Erikson, 1963; Freud, 1965). As a result, their ability to engage in drama and other play activities, which are important in their pre-operational stage of cognitive development, is affected. Accidents also lower children’s academic performance due to the time spent out of school while they are confined in bed during recuperation period. All these negative effects, some of which are not correctable, point to the need to protect children against accidents.

There are various possible causes of accidents to children and global data show a high occurrence of accidents to children at school. In U.K. for example, available data on accidents shows that about, 700 school children below 18 years, die yearly from various causes of accidents such as falls and collisions, while in U.S.A. about 4.5 million school children aged 10 to 17 years were injured in 1988 (Fraser, 1996). In another study in U.S.A. and Egypt, it was
reported that accidents in children at school were higher than those that occur at home (Diehl, 1961; Florio & Stafford, 1969; Kamel, M., Kamel, N., Khashab, & Aziz 1999).

Information on accidents in school children in Kenya, is available but it mainly involves fire related catastrophes in a number of boarding secondary schools (King’ori, 2001 and Nzia & Kavila, 2001). However, there is hardly any mention of pre-school accidents. Some of the reasons for not documenting pre-school accidents may be the belief that accidents in young children cannot be prevented, (Kiminyo, et. al. 2000). Such beliefs may be a direct translation from the Kiswahili saying “Ajali haina kinga” (Saidi, 1984) which when put in English means “An accident cannot be prevented.” Accidents to pre-school children however unlike the saying states, are preventable. Other school accidents in children have been recorded in our local hospitals but a visit to Kenyatta National Hospital and Meridian Medical Centre in Nairobi found only the type of injury and treatment given but the causes were not indicated. Systematic studies on accidents in children have also been done but, they are scanty and those available mainly on home accidents (Oloo 1992; Obara 1998) thus necessitating the study on school accidents.

Before enrolling children into pre-school, parents entrust their children’s safety to other family members apart from hiring baby -sitters. However, in pre-school, there are few teachers minding a large number of children. Young children of tender age like pre-schoolers would therefore be at higher risk of accidents than those in upper classes. Consequently, the government of Kenya in a bid to ensure their safety has provided basic guidelines to be followed in all pre-schools (K.I.E., 1995). The aim is to reduce accidents, thus ensuring children safety,
which is a basic right and crucial for their optimum growth and development (Maslow, 1970; Bula, Holmes, & Nyomi, 1994; K.I.E., 1994; 1995). However, despite the government’s efforts to ensure safety to children, accidents to pre-schoolers continue to persist as studies quoted show. The study on causes of accidents to pre-school children was therefore necessary.

1.2 Statement of the Problem

Accidents may deter children’s proper growth and development apart from causing them pain. They could further lead to illness, deformities and even death. Accidents also hinder play, an important natural learning method in pre-school. In addition, accidents may cause children’s school absenteeism thereby negatively affecting their academic performance. The government of Kenya in a bid to minimise accidents has provided safety guidelines to be adhered to in all schools but despite the effort, accidents among children especially in school continue to persist. In view of these, scholars in Kenya (Oloo, 1992; Gakuru, Koech & Nduati, 1995; Obara, 1998; Nzia & Kavila, 2001; King’ori 2001) have concentrated their studies on causes of accidents at home and post primary institutions of learning such as boarding secondary schools. Data on school injuries in children are available in our local hospitals and show that many of the accident victims are pre-school children. However there are hardly any systematic research studies on school children’s injuries let alone pre-schoolers who are more vulnerable to accidents due to their tender age. The data further emphasises the types of accidents and treatment given but not the causes. There was therefore need to establish the causes of accidents among children in our local schools but particularly pre-schools in order to identify specific ways of dealing with them.
1.3 Purpose of the Study

The purpose of the study was to establish the causes of accidents among young children in Kenyan schools and particularly pre-schools within Westlands Division, of Nairobi Province in relation to factors in the learning and play environments as well as human error.

The problem as was conceptualised is presented in the next section.

1.4 Conceptual Framework

Accidents could be described as a social problem because they are caused by people to themselves or by others as well by as things in their environment but within a given situation when people interact with some predisposing factors. Whatever type of accidents that occur in children or adults do not just happen but are caused by factors many of which are preventable. However, although accidents are preventable, they happen all the same. There was, therefore, a need to focus on the possible reasons why they happen when they should not and how to stop most of them occurring to children. Figure 1.1 below, illustrates the problem of accidents as was conceptualised.
Figure 1.1 Conceptualisation of the Problem of Accidents in Pre-schools

**Accidents**
Physical injuries or Anything swallowed/inserted into body parts leading to 1st Aid/Treatment

**Possible Causes**

<table>
<thead>
<tr>
<th>Play Environment</th>
<th>Learning Environment</th>
<th>Human Factors</th>
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<tr>
<td>- Poor condition of play space</td>
<td>- Inadequate learning materials</td>
<td>- Inadequate supervision</td>
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<td>- Poor condition of play facilities</td>
<td>- Wrong use of learning materials</td>
<td>- Children’s rough play/indiscipline</td>
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<tr>
<td>- Inadequate play space</td>
<td>- Poor condition of learning facilities</td>
<td>- Teachers not demonstrating safe behaviour</td>
</tr>
<tr>
<td>- Unfenced compound</td>
<td>- Inadequate learning space</td>
<td>- Teachers not reinforcing safe behaviour</td>
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<tr>
<td>- Inappropriate type of fence</td>
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<td>- Inadequate play Facilities</td>
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**Possible Intervention Measures**

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<th>Play Environment</th>
<th>Learning Environment</th>
<th>Human Error</th>
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<td>Ensuring of:</td>
<td>Ensuring of:</td>
<td>Ensuring of:</td>
</tr>
<tr>
<td>- Good condition of play space</td>
<td>- Adequate learning materials</td>
<td>- Adequate supervision of children</td>
</tr>
<tr>
<td>- Good condition of play equipment</td>
<td>- Correct use of learning materials</td>
<td>- Enforcement of safe play/discipline in children</td>
</tr>
<tr>
<td>- Adequate play space</td>
<td>- Good condition of learning facilities</td>
<td>- Demonstration of safe behaviour by teachers</td>
</tr>
<tr>
<td>- Fenced compound</td>
<td>- Adequate learning space</td>
<td>- Reinforcement of safe behaviour in children</td>
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<td>- Appropriate type of fence</td>
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<td>- Clear instructions to children</td>
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<td>- Adequate play facilities</td>
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**Expected Outcome**
- Public awareness on causes of accidents to children in pre-schools
- Enhanced safety and reduced accidents in pre-school children
- A tool to review and improve policy on child safety in place
Figure 1.1 above shows the problem of accidents to children in pre-school, its intervention and also the expected outcome after the study.

In pre-schools, children could suffer negative consequences of accidents as they interact with their learning environment, play environment and also other human beings. In the learning area, accidents to children could emanate from sharp learning materials, equipment or tools such as scissors and razors as well as inappropriate and inadequate learning area. Human error such as the teacher’s inadequate supervision and children’s rough play/ indiscipline could also lead to accidents among children in pre-school. Gender differences in particular could lead to more injuries in boys than girls due to their rough and tumble play especially where there is inadequate supervision. In addressing the above causes of accidents in pre-school the main concern was to determine the extent to which interaction with the play environment, learning environment and human error contributed to accidents. Intervention measures, therefore, focused on actions that could minimize accidents such as use of appropriate facilities, children becoming disciplined and adequate teacher supervision of children being ensured among other safe practices. The three factors: human error, the learning environment and play environment were examined based on the objectives and alternative hypotheses generated below, in order to agree or disagree with the stated evidence from authorities cited.

1.5 Objectives of the Study

The objectives of the study were:

1. To find out the number of children’s accidents during different times in pre-school.
2. To identify the type of common accidents among children in pre-schools.
3. To establish the number of children’s accidents due to factors in the play environment.
4. To find out the number of children’s accidents due to factors in the learning environment.

5. To identify the number of children’s accidents due to human error in pre-school.

6. To compare the number of accidents that occur among children in public and private pre-schools.

7. To establish the number of injured children according to gender in pre-school.

8. To find out if first aid treatment was administered to children injured in pre-school.

9. To compare the number of accidents due to factors in the play environment, learning environment and human error.

10. To establish the number of absent children due to accidents in pre-school.

1.6 General Hypotheses

The following were the general hypotheses formulated:

\( H_{A1} \). Children’s accidents due to poor condition of the play-space and play equipment in pre-school differ in number.

\( H_{A2} \). Children’s accidents due to use of inadequate indoor-classroom learning materials and wrong use in pre-schools differ in number.

\( H_{A3} \). Children’s accidents due to inadequate supervision by teachers, and children’s rough-play/indiscipline in pre-schools differ in number.

\( H_{A4} \). The number of accidents that occur to children in public pre-schools, differ from those in private pre-schools.

\( H_{A5} \). Children’s accidents due to factors in the play environment, learning environment and human error in pre-schools, differ in number.
1.7 Significance of the Study

The research aimed at promoting safety care for children who were the main beneficiaries in the study. A safe environment would facilitate learning through play, which is the most important as well as natural learning method for children. By pointing out the major causes of accidents, preschool head-teachers as well as teachers would be encouraged to minimize accidents, which would in turn reduce children's absenteeism and hence improve in their school work. Child caregiver's would also be able to identify the major causes of accidents and deal with them appropriately. The National Centre for Early Childhood Education (NACECE) and the District Centre for Early Childhood Education (DICECE) could also use the study findings to improve their child safety-training curriculum. The results would also enhance the attainment of the government's policy of having a healthy nation if accidents in children were minimized.

1.8 Limitations and Scope of the Study

1.8.1 Limitations of the Study

There were a few factors that affected the researcher's school's visit route plan making it necessary for its re-organization. Head teachers of some of the sampled pre-schools, felt that the issue of accidents was a sensitive one and particularly declined having parents being interviewed, leading to non-participation. Interference with the school timetable was also another issue which made some schools reluctant to participate. Despite having obtained the research permit, some public pre-schools further required the researcher to seek clearance not only from the Ministry of Education Headquarters, but also from the City Education Office, a problem that had not been anticipated since it never arose during piloting. However where such problems were experienced, another school was randomly selected to replace the previous one.
1.8.2 Scope of the Study

The study focused on reported types of accidents and their causes among children in preschools within Westlands Division, Nairobi Province, Kenya but not actual observed cases by the researcher. The study neither covered accidents at home, nor on the way to or from school despite their importance and reflects the reported causes of accidents among children in Westlands Division only and therefore cannot be necessarily used for generalization to other divisions in Nairobi or elsewhere. However, the results could be used as a basis for research in other areas. The sample for teachers only included class teachers who had witnessed accidents to children in school and having served in a particular pre-school for more than a year while sampled parents were only those whose children had been injured in school during the study period. In addition, the research was entirely based on self-reports of teachers and parents who volunteered information on accidents in their children while within the pre-school compound since they were well placed to have the details of injuries.

1.9 Assumptions

a) One of the study assumptions was that children’s accidents in preschools were a reality but preventable. This is possible if the management puts in place safety measures, which would stop the accidents from occurring.

b) When parents enrol their children in pre-school, they temporarily hand over the responsibility of their children’s care to teachers and presumably trust that their children would be safe under them. It was therefore assumed that the school management has the
responsibility to protect children from accidents and to assure stakeholders of this protection.

1.10 Definition of Terms

**Accident:** Any physical injuries or anything swallowed or inserted into body parts by pre-school children while within the school premises and leads to any form of treatment to promote recovery.

**Cause of accident:** Any unsafe behaviour or condition within the pre-school.

**Pre-school:** Educational set up serving age 3-6 children before joining primary school.

**Caregiver:** Person charged with the responsibility of caring for children in pre-school.

**Learning Environment:** In-door classroom learning area in pre-school.

**Play Environment:** Out-door play area in pre-school.

**Westlands Division:** Administrative area in Nairobi province also known as Parklands.
CHAPTER TWO
LITERATURE REVIEW

2.1 Theoretical Framework

The study was based on the Domino Theory on accident causation developed by Heinrich (1959). The theory was for the prevention of industrial accidents, but in this study it was applied to school context. The theory advocates for prevention of accidents before they occur and that the management is responsible for ensuring total safety to workers within their organization. It states that injuries result from a completed series or sequence of events or by action of preceding factors. Interruption of the sequence or removal of the unsafe condition or factor prevents the accident from happening. The accident situation could be viewed or explained in System’s Perspective Theory, whereby different elements function together and the effect of one element affects the others (Bertalanfay, 1976). According to the Domino Theory the factors in the sequence of accident are: ancestry and social environment, fault of person, un-safe act and mechanical or physical hazard, accident and finally injury.

The ancestry and social environment, which is the first in the sequence of the Domino theory, could be described as the entire industrial area in which workers interact with one another as well as machines and equipment during production of different goods, where the accident sequence begins. The second stage characterized by fault of person, constitutes omissions such as lack of ensuring routine procedures in the factory by managers or other workers. A fault by the management such as not servicing machines regularly or a worker not closing a gas tap after use, could cause an accident. The third stage constitutes the wrong actions committed by the management or workers. The fault from the previous stage could for example lead to anxiety.
and unsafe act such as someone lighting a cigarette thus causing a factory fire. Mechanical or physical hazards like over heating in machines or simply their breaking down could also lead to accidents. The fault usually increases the risk of unsafe acts or mechanical hazards. In the fourth stage, the fault of person, unsafe act, physical or mechanical conditions in the previous step, leads to accident, although non injurious or without loss of property. The gas tap for example could leak but depending on the low intensity of leakage, no fire broke out despite someone lighting a cigarette. The above initial factors in the causation of accident are usually preventable, but once it gets to the fifth step, which is the injury stage, harm or damage is unavoidable. The seriousness of the injurious accident however depends on the level of force of accident.

In pre-school, accidents to children could also follow a similar sequence like in the Domino theory. The first stage in the Domino theory, which is the ancestry and social environment if applied in pre-school situation, could be described as the total pre-school environment including classrooms and play area or compound in which the accident sequence begins.

In the second stage, the fault of a person includes actions such as omissions of necessary routine procedures in pre-school by caregivers such as not checking on equipment for breakage or tear and wear. Failure by teachers to supervise children or not providing a safe play or learning environment could constitute the fault of person. Children’s faults might include refusing to take turns or not returning materials in their right place, which could in turn lead to accidents. A ball left in the wrong place for instance could be tripped on and cause a bad fall.
In the third stage, the unsafe acts and/or physical hazards could include caregivers not providing adequate supervision, which could lead children to engage in unsafe acts. Children could, for example, be involved in unsafe acts like rough play, pushing or pulling. Physical hazards such as broken play equipment or an unfenced school compound could also pose risks to children. The broken equipment could cause cuts in children while a poor or unfenced compound could allow unwanted people like mad men to access the school compound and harm the children. Animals reared in school for learning purposes on the other hand if let loose could also cause bites or scratches in children.

Fault of either the caregivers or even children’s committed in stage two of the accident sequence, coupled with stage three’s unsafe acts and or physical hazards could lead to the fourth stage of accident which is the non injurious stage. Rough play, pushing or pulling in children as well as broken play equipment or unfenced school compounds could for example lead to children falling down, being hit or running out of the school compound without sustaining physical harm.

The child who sustains a fall precipitated by actions in the second, third or fourth stage in the Domino theory may end up with an injury, which is the fifth stage in the accident sequence. The causes of accidents up to the fourth stage of the accident sequence are preventable but once it gets to the fifth or injurious stage, the impact or force in the accident sequence is already too high and harm inescapable. The severity of injury also depends on the impact of the accident. The injuries that could be sustained by children include cuts, swelling, sprains and fractures among others. From the Domino sequence of accidents, it is never known in advance whether an
accident would be injurious or not and therefore, it is safer to prevent the accident from occurring altogether before it gets to the fifth stage.

Heinrich (1959) further states that 88% of accidents occur due to unsafe acts by persons, which in this case might be teachers’ and children’s acts, 10% by unsafe physical or mechanical conditions which in pre-school are the play and learning facilities, while 2% occur by chance. It is therefore important to note that it is only when all safety measures are strictly put in place that as few as 2% of accidents in children must inevitably occur in pre-schools. Efforts to minimize accidents should thus be ensured and as Best (1963) states, “prevention is better than cure” especially when cost aspects and agony in treating the children are concerned.

The theory was chosen because like in an industrial firm, a school is similarly an institution where children interact with various physical and mechanical facilities at times, just like industrial workers do. During learning or playing time children or their teachers could commit faults or unsafe actions that could ultimately lead to simple or serious accidents. Curbing the faults and unsafe actions as the theory suggests could therefore minimise the occurrence of accidents in pre-schools. In addition, the Domino Theory like in many other theories of accident prevention, such as the Systems Perspective and Human Factors, Frager (2000) suggests that they follow a scientific or logical sequence of steps which are almost similar and differ minimally depending on the model. The various models generally follow seven steps almost similar to the Domino theory. The steps are: establishment of the context like the ancestral stage in the Domino theory, identification of risks, risks analysis, risks evaluation, risks treatment,
monitoring as well as reviewing and finally communicating or consulting about the entire accident situation.

Applying the theory in pre-school would most probably challenge pre-school teachers and managers to work towards the reduction of accidents by guarding against faults such as failing to engage in safe behaviours or to withhold themselves from committing wrong actions that contribute to accidents. The move would therefore contribute to more efficient use of resources through lowering costs and building a continuous improvement process whereby risks are better identified, analysed and treated. The study intended to confirm whether most accidents among children in the pre-schools sampled occurred due to human error or not with a view to suggest what positive actions would minimize accidents among children in pre-schools within Westlands Division, of Nairobi Province. The study also traced the phenomenon of accidents from ancient history, discussed in the next section.

2.2 Historical Perspective of Accidents

Accidents as indicated by Sherwood (1994) were in existence as early as 3000 years ago or more. Despite the early existence of accidents, studies on their causes appeared to have been considered much later, perhaps due to the belief that accidents were acts of God (Strasser, Aaron, Bohn & Eales 1973; Beaver, 1994). During the Industrial Revolution of 1898, causes of accidents resulted in their specific preventive measures being put in place in factories. Machine areas for example, were fenced off and insurance schemes introduced (Lenz, 1950; McKiever & Lear, 1950; Strasser et. al. 1973; Corn, 1978; Richards, 1985; Mintz, 1989; Corn, 1989; Rhodes & Blanton, 1990; Sherwood, 1994). It appears however that it was not until the International
Year of the Child in 1979 that attention was focused on accidents resulting in studies on school injuries being undertaken in Sweden, Britain, U.S.A., and Australia among other countries (Schelp, Ekman & Fahl, 1991; Jones & Olam, 1995; Fraser, 1996; Stone, 1996; Kamel, et. al. 1999). These studies however, are all from developed countries and not in the Kenyan context. In another study in U.S.A., Kamel et. al. (1999) reported that the greatest proportion of all deaths due to injury occurred to children and young adults with higher death rates in infants followed by pre-school children. The high occurrence of accidents in children of below 5 years therefore makes the study on accidents to children in pre-school necessary.

Further information on accidents from Africa and other developing countries by the World Health Organization in both developed and developing countries reveals that accidents are a major cause of mortality and disability (Manciux and Romer, 1991). In Kenya, widespread pre-school education started after independence (K.I.E., 1995) and most children joined Standard one at about ten or more years of age without going to pre-school. However, school entry age today appears to have been revised downwards to six years for standard one, five years for public pre-schools, and three years or less in private schools. Older children can be said to be able to avoid accidents on account of their maturity, but pre-school children would be at high risk since their sense of judgment is not well developed. The study on the causes of accidents thus aims at the enhancement of safety among the youngest group of all children in school in order to protect them from many of the common types of accidents discussed below.
2.3 Types of Common Accidents to Children in Pre-school

Accidents to children occur in all types of environments, although most of them happen in or on the way to or from school where they spend most of their active life (Diehl 1961). Among the accidents, wounds are the most prevalent, sustained from falls, cuts, bites, stings, burns, scalds and fractures (Beaver 1984; K.I.E. 1994; Stoppard 2001). Accidents related to fractures in children however may be lower due to their muscle/tendon flexibility and the fact that their bone/cartilage ossification is not yet complete (Meeks & Heit, 1991). Other types of accidents in pre-school are stuffing of foreign objects in the ear or nose, suffocation, poisoning, bangs, sprain, dislocation of joints and drowning. In addition, some children particularly autistic cases and boys are more prone to these accidents (Seifert, Hoffnung, Skeels & Dye 1987; Ezewu 1983). The difference could be explained in part by mental deficits in autistic children or the fact that boys are biologically stronger in physique and more daring to venture into discovery activities than girls who traditionally are required to be gentle (Ezewu 1983; Seifert et. al. 1987). However with proper supervision there should be minimal accidents in children due to physical or mental differences.

The teacher’s knowledge in first aid, however, is important because most accidents and particularly wounds if not treated may worsen and K.I.E. (1997) emphasizes on the importance of teachers being trained in administration of first aid, which promotes recovery in a short time. In addition, VAS (1997) emphasises on the usefulness of a first aid kit for treatment of minor injuries. Pre-schools should therefore ensure the availability of a well-stocked first aid kit always. First aid treatment also helps in reassuring the children that their caregivers love them and are concerned about their predicaments. This is an important component for their socio-
emotional and psychological development as emphasised by (Erikson, 1963 & Freud, 1965). The present study therefore aims at finding out whether injured children were given first aid and whether or not gender difference had any influence on the causation of accidents.

Several empirical studies further show that most of the above injuries in children are due to falls and bangs (Schelp, Ekman & Fahl, 1991; Jones & Olam, 1995; Fraser, 1996; Stone, 1996; Kamel et al. 1999). In Australia, Jones and Olam (1995) reveal that bruises and fractures are among the most frequent common accidents to children due to falls. In Britain, Kamel et al. (1999) also state that accidents kill an average of 700 school children every year, but if the non-fatal accidents are accounted for the number of accidents is much higher. In another study, Kamel et. al. (1999), found that among 983 school children aged below 3 years, 73 of them sustained injuries in U.S.A. during 1983. Accidents are also described as a leading cause of school absenteeism in the same study. In yet another study in U.S.A., it is estimated that about 4,505,000 of school children aged between 10 and 17 years were injured during 1988 (Fraser, 1996). In the Kenyan context, such children are in upper primary and secondary schools. It was therefore worthwhile to establish what percentage of Kenyan pre-school children were involved in accidents while at school.

In Africa, empirical studies conducted in Egypt, indicate that 72.6 % of injuries to children occurred in the school compound while 27.4% took place outside school (Kamel et. al., 1999). Falls accounted for 49.2% accidents and were the most common followed by collisions at 25.2% while bruises accounted for 51.6% injuries and fractures 23%. Other types of injuries were burns and joint dislocation. Fraser (1996) and Kamel et. al. (1999) show a high accident
occurrence to children within the school environment. In Kenya, systematically obtained data on causes of school accidents were scanty and available information was focused mainly on fires in some boarding secondary schools (Gicheru and Mumo, 1998; Murigi, Wabala and Waithera, 1999; King’ori, 2001; Nzia and Kavila, 2001). However, first hand information shows two preschool children in Nairobi who had suffered serious accidents. The first had a deep cut on the forehead while the other had a broken arm, and were treated at Meridian Medical Centre and Kenyatta National Hospital, respectively. The causes of accidents, however, were not indicated. The study therefore intended to find out the causes of accidents to children in pre-schools.

In empirical studies on home accidents among Kenyan children conducted in Marigat Division of Baringo District, Oloo (1992) reports that burns and scalds accounted for 82.8% accidents among children and youth below 20 years. Falls accounted for 53.3% of accidents and most victims were below four years old. Other accidents were snakebites, thorn pricks and assaults. In Kibera Division of Nairobi, Gakuru, Koech and Nduati (1995) report that the majority of accident victims under 20 years of age were below five years of age. The most frequent types of accident in order of occurrence were falls, cuts, burns and scalds. Falls were due to slippery surfaces, while cuts were from knives, blades or broken glass. In Kisumu District of Nyanza Province burns in children were due to cooking activities being conducted with fire on the ground within children’s reach, falls due to tripping over objects, poisoning from snakes or overdose from medicine and were the most common accidents at home among the under fives (Obara, 1998). These studies, however, covered home accidents, but the current study hoped to generate information on causes of accidents to children in schools and specifically in pre-schools.
2.4 Causes of Accidents among Pre-school Children

There are many possible causes of accidents, as discussed below, and in order to ensure child safety, the causes of accidents need to be identified and appropriate preventive measures taken.

2.4.1 Human Error

Stoppard (2001) observes that accidents to children usually occur, when routine procedures are neglected or the caregivers are stressed, or disturbed and unable to give full attention to supervision of children. Neglecting routine procedures and stress could be an indication that teachers are de-motivated, leading to dissatisfaction in their job and reduced enthusiasm to carry out their duties effectively. Waithaka (2003) concurs with these sentiments and suggests that paying teachers their salaries in time among other motivators increases their level of job satisfaction and in this case it could be postulated that paying them at the right time could improve their performance in supervising children. Gumo (2003) similarly states that the teachers’ level of training is related to how well or not they perform.

At learning time, children use materials such as counters and sharp objects like pencils, which could result in injuries to children if there is inadequate supervision (K.I.E., 1992a; Stoppard, 2001). At mealtime, choking could occur in children while exposure to hot food or drink could result in burns or scalds K.I.E. (1992a); Obara, (1998) if adequate care is not ensured. During outdoor lessons, accidents like falls, collisions or bangs could occur while medicine carried to school by sick children could also cause poisoning through taking incorrect dose. To enhance effective supervision, K.I.E. (1999) advocates for a teacher-child ratio of 1:25-30 for three to four year olds and 1:35 or less for five to six year olds. It is hypothesized that private schools
might observe the teacher-child ratio issue more strictly than public ones in order to safeguard their reputation, which would most probably translate into fewer accidents to children in the private schools than in public. The study therefore intended to find out if the types and causes of accidents in public and private pre-schools were similar or not.

Lack of clear instruction could also cause accidents. In outdoor lessons, children normally use different play equipment and some equipment like the swing requires to be used by only a limited number of children at any one time, while the seesaw requires instruction on how to hold on to the rails and also sit in order to balance. For children to use the slide, they need to be in a single line and take turns. During cutting activities with scissors children need to be instructed on how to handle them. Reported accidents, which could occur due to lack of clear instructions, are: falls, cuts, stubs (Beaver, 1984; K.I.E, 1992a). The present study therefore hoped to establish whether teachers' lack of clear instructions to children in the sampled pre-schools caused accidents or not.

Failure to demonstrate safe behaviour and role modelling could also cause accidents in children. According to Bandura (1977) and K.I.E (1995), children learn by observation and imitation. Pre-school children could therefore learn behaviours like pinching and beating from teacher's habits such as corporal punishment thereby inflicting harm to others or themselves. Failure by the teacher to reinforce safe behaviour in children could also be another cause of accidents. Skinner (1956) emphasizes reinforcement as an important tool for shaping human behaviour. Teachers could also reinforce safe behaviour in children through use of safety education stories whereby an obedient character or child was awarded or escaped serious accident due to
practicing safe behaviour the caregiver had taught. K.I.E. (1999) cites story telling as an effective teaching tool for pre-school children. In addition, children take pride in competition to undertake new tasks or challenges during learning and praise for doing it safely and correctly encourages them to attempt. The study therefore tried to find out whether or not teachers’ failure to demonstrate and reinforce safe behaviour in children was a cause of accidents to children in pre-school.

Discipline is also a prime requisite for safety and no school environment can be considered safe unless students co-operate in prevention of accidents (Florio & Stafford, 1969). Although pre-school children can be easily moulded to follow school rules, some children are inclined to rough play and other forms of in-discipline, which could result in injuries to themselves and others (Olembo & Wanga, 1992). Rough and tumble play may be caused by a scramble for inadequate play or learning materials, wanting to show their prowess, or just being different from others thus leading to accidents from bangs (Stoppard 2001). Olembo and Wanga (1992) further show the need to restore and maintain a reasonable level of discipline among school children. During the period of adjustment from home to school, some pre-schoolers also display anti-social behaviours such as aggression, which could lead to accidents (Benaars, Otiende and Boisvert, 1994). The study, therefore, attempted to establish whether or not human error by both children and teachers had any significant role to play in causing accidents.

2.4.2 Play Environment

Play is one of the most important learning methods in pre-school which provides the children with an opportunity to move about freely K.I.E. (1994) and it should be done in a safe
environment. Safety includes the condition of play space, which if not taken care of could cause accidents (V.A.S., 1987, K.I.E., 1992b; K.M.A., 1988). Beaver (1984) further reports that falls due to various causes in the play environment account for 70% of accidents sustained. Poor maintenance of play facilities, incorrect use, un-cushioned landing surfaces, loose bolts, broken play equipment and use of non-standard size equipment by local carpenters or manufacturers are all possible causes of injuries in children (Stoppard, 2001). Incorrect use of play equipment like sliding head first, or jumping from the climbing frame could for example also lead to injuries like sprains or fractures. Use of wet play equipment could also lead to skids and falls while sun-scorched metal frames on play equipment could burn children’s tender skin. Improperly fixed play equipment on the other hand could snap off thereby causing injuries (Hobbert and Frankel, 1995) and as a result, the study sought to establish whether the condition of play equipment in the pre-schools sampled contributed to children’s accidents or not.

Poor condition, inadequate and wrong use of small movable play materials like balls, beanbags, relay batons and rolling wheel tyre could also cause injuries to children. Some common injuries that could be sustained include swellings and bruises (Stoppard 2001). At the sandpit, sand could cause eye injuries, while worn out tyres with exposed wires could cause cuts to children. Apart from the condition of play facilities, their inadequacy could also lead to children fighting for different materials thereby precipitating accident situations. The study thus tried to find out if the types of play facilities in use in the sampled pre-schools, were major causes of accidents to children or not.
The state of the school compound and play area could also contribute to accidents. According to K.I.E. (1995), safety in the pre-school compound and play area involved securing the place with an appropriate fence and provision of safe play facilities. However, materials used could pose some dangers like pricks and cuts from sharp iron sheet edges or splintered wooden off cuts. Bites and stings from insects hiding in the live plant hedge and also the sap from some poisonous plants like rhubarb, tomato leaves and lily of the valley could also be harmful to children's eyes or cause discomfort if ingested (Stoppard, 2001). Long grass in the play area, pauses danger to children as it may hide snakes that could consequently bite children while potholes, sharp objects and uneven ground also provided good opportunities for accidents to occur. Animals kept in school for learning purposes like cats and dogs could bite, scratch or cause allergies while insects like bees and wasps could sting children (K.I.E. 1992a; Stoppard, 2001). Swimming pools are other facilities in the school compound that children use but could cause drowning if there is inadequate supervision. Meeks and Heit (1991); V.A.S. (1997) have described ways of ensuring children's safety while in water. The study hence purposed to find out whether the available play facilities in the pre-schools sampled had a role to play in causing accidents to children.

2.4.3 Learning Environment

The learning environment, which includes buildings, materials, tools and equipment as well as space, could also cause accidents. Common materials used in pre-schools are counters, which K.I.E. (1990; 1992a), Obara (1998), Bruce and Meggit (1999) and Stoppard (2001) indicate could cause children accidents. Children could for example fight over inadequate materials due to their egocentric nature (Piaget 1984). Teachers however need to help children learn to share
materials at times but should as much as possible provide adequate materials so as not to frustrate them in their activities.

Misuse of learning materials could also cause accidents. Examples of misuse of materials are swallowing or inserting small objects into the nose or ears. Other learning tools like pencils, play-dough and paints could also cause lead poisoning, choking and other injuries if children chewed or swallowed them. K.I.E. (1992a), Obara (1998) and Stoppard (2001) have shown the danger of instant death through choking or suffocation in children if they wear plastic bags over their heads, hence the need to ensure safe use. Wrong use of learning materials could also occur because children are naturally curious K.I.E. (1994) and may seek to discover or experiment with new ways of use, which may not be safe. Other types of accidents with learning materials in children are contamination from pesticides found in discarded containers brought to school as learning equipment and inflammable materials like matches, open fires or lighted candles which could cause burns. Children might also sustain injuries by poking or inserting things into electrical appliances and Bruce and Meggit (1999) advocate for safety in children’s use of such equipment. The study thus tried to find out whether or not inadequacy of learning materials or misuse in pre-school caused children’s accidents.

Size of the classroom space in relation to the total number of children could also lead to accidents. According to K.I.E, (1990) each child requires 1m² learning space to allow for free movement and use of tables, and chairs but the way the furniture is arranged could create restriction hence accidents as children try to move about in or out of class (Hobbert & Frankel, 1995). In addition to space, inappropriate and inadequate size of furniture could also lead to
injuries. K.I.E, (1990), recommends that the height of pre-school chairs should be between 24.5 – 35.5 cm while tables should be 50 -63.5 cm. The study thus tried to determine whether or not the condition, adequacy and size of learning facilities in the pre-schools sampled played any role in accident causation.
CHAPTER THREE
METHODOLOGY

3.1 The Research Design
The ex-post facto research design was used in the study, and Fraenkel & Wallen (2000) have explained that this design determines differences that already exist between or among groups of people. It investigates the cause and effect relationships between variables by observing the existing condition and searches back in time for plausible causal factors. It is a good exploration tool where rigorous experimental research or manipulation of variables cannot be carried forward. The design was therefore suitable for use in the current study because the accidents as well as their causes were already in existence and the variables could not be manipulated.

3.2 The Location of Study
The study was conducted in Westlands Division of Nairobi also referred to as Parklands, and was randomly selected from the eight divisions of Nairobi. The Nairobi Province was purposively selected due to its large population of pre-schools, within a small area. Nairobi province also cuts across schools located in all socio-economic types of background such as Kibagare and Soweto slums and the posh Runda and Muthaiga residential areas. It also has pre-schools in areas that could be described as having urban settings such as Lavington, Westlands and Muthaiga, semi urban like Kangemi and Kawangware as well as rural such as Upper and Lower Kabete. It therefore more or less gives a better representation of the Kenyan children, their type of play facilities as well as learning facilities typical in the different provinces.
3.3 The Target Population

The study targeted all the 187 pre-schools in the division, and only 437 class teachers who had observed accidents in pre-school children and further served in one school for more than a year. Parents of 3011 pre-school children who had sustained injuries in school were also targeted for study. Out of the 187 pre-schools, 158 were private and 29 were public. Of the 29 public pre-schools, 24 were attached to primary schools while 5 were city council day care-centres.

3.4 The Sampling Technique And Sample Size

3.4.1 The Sample Size

In order to identify the causes of accidents to children, pre-schools, teachers who had served for more than a year in one pre-school and had observed accidents in children and only parents whose children had sustained injuries in school were sampled.

i) Number of schools:

The pre-schools were selected, as follows:

From the total population of 187 pre-schools, 56 (30%) schools were sampled for study. Gay (1981) has shown that a sample size of 10 % to 30 % of the total population is adequate for study in descriptive research.

ii) Number of teachers:

As for the teachers, only those who had had observed accidents in children and served for more than a year in one school during the study period were included for sampling. Their total number was 437 and thus 131 (30%) of them were initially sampled and after distribution among the 56 pre-schools, the final sample was 112 teachers. Gay (1981) observes that 30% sample size is adequate in descriptive research.
iii) **Number of parents:**

From parents of the 3011 children who had been injured in pre-schools within the division, 351 of them were included in the initial sample. However in the sampling process, the 351 parents were evenly distributed among the 56 pre-schools thus the final sample was 336. According to Mulusa (1990), the sample size was also adequate for a population of above 3000 but not more than 4000.

### 3.4.2 The Sampling Technique

Multistage sampling technique proposed by Peter (1994) was used to obtain a representative sample as follows:

#### a) Province:

Nairobi Province was purposively selected from all the 8 provinces in Kenya. For the rationale of its selection see section 3.2).

#### b) Division:

Westlands division was selected randomly from the eight divisions in Nairobi province. Eight pieces of papers on which the name of each division in Nairobi Province was written per paper were mixed up and the researcher while blindfolded so as to eliminate bias fished out one of them, which happened to be Westlands.

#### c) Schools:

Random listing of all the 187 pre-schools in the division was done, then they were stratified into 158 private and 29 public schools. In order to obtain a fair representation of the schools according to their total number, 56 pre-schools were proportionately and randomly selected as
was in the case of the division, giving 47 (30%) of the 158 private pre-schools and 09 (30%) of the 29 pre-schools from public (see Table 3.1 below).

d) Teachers:

From a total of 561 teachers, 437 of them who had observed accidents in children and had served in one school for more than a year were purposively selected initially. Out of 437 teachers, 131 (30%) of them were evenly distributed among the 56 pre-schools thus obtaining a sample size of 112 teachers from which two teachers per pre-school were randomly selected for interview (see Table 3.1).

e) Parents:

All the parents in the division were asked to indicate whether or not their children had sustained any accidents in pre-school and 30110f them whose children had been injured in school only were purposively selected from a total of 3640. An adequate sample size of 351 parents from the 30110f them as observed by Mulusa (1990) was sought (see Section 3.4.1 “iii”) by distributing the 351 parents among the 56 pre-schools. In the process a sample size of 336 parents was obtained from which six parents per pre-school were randomly selected to answer the written questionnaires. The questionnaires were sent to the parents through their children. For the schools, teachers and parents sampling distributions see Table 3.1 below.

<table>
<thead>
<tr>
<th>Sponsorship</th>
<th>No. of Schools</th>
<th>No. of Teachers</th>
<th>No. of Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
</tr>
<tr>
<td>Private</td>
<td>47</td>
<td>83.9</td>
<td>94</td>
</tr>
<tr>
<td>Public</td>
<td>09</td>
<td>16.1</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>100.0</td>
<td>112</td>
</tr>
</tbody>
</table>

Table 3.1 Final Sampling Distributions of Schools, Teachers and Parents
3.5 Study Variables

The study explored two types of variables, namely, dependent and independent.

3.5.1 Dependent variables

The dependent variables were any physical injuries or anything swallowed or inserted into body parts by pre-school children while within the school premises and led to any form of treatment to promote recovery.

3.5.2 Independent variables

The independent variables were the factors that contributed to accidents such as poor condition of play space/equipment, use of inadequate learning facilities/wrong use and inadequate supervision of children as well as children’s rough play/indiscipline.

3.5.3 Measurement of variables

A self constructed, 3-point scale (low = 1 point, medium = 2 points and high = 3 points) was used to determine how high or low the number of children’s accidents were during learning or play activities.

- Human Errors

These were determined by considering teacher’s supervision of children and children’s discipline/safe Play.
i) Supervision By Teachers: Actively watching over children was assigned a score of 1 point, inconsistency in watching 2 points and total failure 3 points.

ii) Children’s Discipline/Safe Play: Obedient behaviour, safe play, coupled with self-control in children was assigned 1 point, where only one of the above characteristics were evident 2 points and 3 points where any two of the above behaviours were present.

- Play Environment

It involved consideration of condition of the play space and play materials/equipment.

i) Condition of Play Space: 1 point was assigned if playground was fenced, levelled and without sharp/dangerous objects, 2 points where one of the three conditions were evident and 3 points where two out of the three conditions were evident.

ii) Condition of Play Materials/Equipment: For materials that were not damaged 1 point was assigned, 2 points where they were damaged but kept out of bounds for use until they were repaired and 3 points if damaged and still in use.

- Learning Environment

It involved consideration of classroom/furniture size and condition of children’s furniture and learning materials or tools.

i) Inadequate Learning Materials

For provision of adequate learning materials, a score of 1 point was given, 2 points where materials were moderate and 3 points where serious inadequacy prevailed.
ii) Wrong Use of Classroom Learning Materials

Correct use of learning materials by majority of children, was given 1 point, incorrect use by about 50% of them was assigned 2 points and where more than half the class used materials incorrectly, 3 points.

3:6 Research Instruments

An interview guide for teachers and questionnaire for parents were used.

3.6.1 Interview Guide for Teachers

The purpose of the interview guide for teachers was to establish the existence of accidental injuries among children in pre-schools, type, area of occurrence and their causes. It was only administered to pre-school teachers who had observed accidents in children while at pre-school and had further served in one school for more than a year during the study period (see 3.7.2 for its administration). It was appropriate because both the interviewee and interviewer could clarify or elaborate their answers or questions. More information from the interviewee could also be obtained through probing. The interview guide had two parts, A and B. Part A consisted personal information about the teachers such as educational background, gender and age while part B contained interview questions (see Appendix A).

3.6.2 Questionnaire for Parents

The questionnaire was only administered to parents of children injured within the pre-school premises. It was used to collect information on the causes of accidents, treatment given by teachers, or children's absenteeism in order to allow for further treatment at home or in hospital
(see 3.7.2 for its administration). It was appropriate in cross checking parents’ and teachers’ responses and also covered a large population easily. It also provided similar questions to all respondents and encouraged honest answers since it guaranteed anonymity to respondents. The questionnaire had two parts, A and B. Part A contained personal information on parents and part B focused on accidents and risky situations they might have observed in pre-school (see Appendix B).

### 3.6.3 Validity of the Instruments

Validity answers whether the data collected are accurate enough to reflect the true happenings in a study (Mugenda and Mugenda 1999). The research tools relied on events that happened in the past, as reported by the respondents such as parents and teachers in the study. If the findings were true the observations in the same pre-schools would confirm factors to be the same if the study were to be repeated under similar conditions. In the study, content validity was ensured by using, standardized questions, and adapting as well as modifying some of the items in the interview guide and questionnaire from Obara (1998) and Rukangu (2000). The questionnaire items were carefully thought out and designed to answer the study objectives. The questionnaire items specifically indicated the reported types of common accidents and their causes, how high or low in number they occurred among children at different times in pre-school, whether first aid was administered to injured children and impact accidents caused in children. The research instruments were also developed, under professional guidance, pre-tested and necessary improvements done to further ensure that they accurately yielded the kind of information required.
3.6.4 Reliability of the Instruments

Reliability is the extent to which a test gives consistent results. In order to ensure reliability of the instruments, standardized questions in the questionnaires were clearly constructed and first pre-tested to ensure consistency in measurement. The split half technique was then used to test the reliability of the instruments. However, qualitative data was first coded and assigned specific scores. The questionnaires for teachers were randomly split into two halves and the sum totals for the two sets established after which the same procedure was followed with parent questionnaires. The two halves of questionnaires from teachers and then those from parents were then separately correlated using the Spearman correlation (rho). The spearman correlation rho between responses for the two halves of teacher questionnaires was $r = 0.947$, significant at 0.01 level ($r = 0.947, P < 0.01$) $N = 18$ while for parents' it was $0.727$, significant at 0.01 level ($r = 0.727, P < 0.01$) $N = 20$. The correlation coefficients for both halves of the teachers and parents' questionnaires were far above 0.5, indicating the instruments' reliability.

3.7 Data Collection Procedure

Data were collected in two phases during the pilot and main study.

3.7.1 Pilot Study

The purpose of the pilot study was to pre-test the research instruments so as to ensure that they were well constructed to give consistent results and to remove ambiguities. It also helped to detect the adjustments that were necessary before under taking the main study. Face to face interviews were done with 20 teachers from 10 schools, visiting 3 schools each on day one and two, and 4 on day three. Twenty parents responded to written questionnaires distributed to them
by teachers, through their children and the above pre-schools were excluded from the main study. Before the pilot study, two days were used to visit the schools for familiarization and introduction to the school authorities.

3.7.2 The Main Study (School Visit Schedule)

About two months were used to collect data on the types of accidents that occurred during the study period. Using oral interviews with teachers and written questionnaires for parents, data on the types of accidents and their causes as reported by the respondents were recorded. The administration of the questionnaires and interviews were conducted as follows: During the two months, of data collection, familiarization visits and administration of the interview for teachers and questionnaire for parents were done. The researcher first interviewed the teachers before explaining to them about the questionnaires to be answered by parents. The teachers were then delegated the task of distributing the questionnaires to parents through their children. About 2 schools were covered per day, making the entire data collection period about 60 days. The data were finally analysed as described in Chapter 4.

3.8 Logistical and Ethical Considerations

The acquisition of the research permit from the Ministry of Education, Science and Technology (M.o.E.S.T.) as well as familiarization of the researcher to the study area was done before the study commenced. Other considerations included creating rapport between the pre-school managers, teachers and the researcher. All information was kept confidential and respondents assured of this protection. The respondents were also made aware of the purpose of the
the study in order for them to make an informed decision to participate or not. Below are the hypotheses that were tested.

3.9 Statistical Hypotheses

One-way Anova was used to test all the 5 study hypotheses (see rationale for use Section 4.1).

**Ho.** There is no significant difference between the number of children’s accidents reportedly due to poor condition of the play-space and play equipment in pre-school.

**Ho2.** There is no significant difference between the number of children’s accidents reportedly due to use of inadequate indoor classroom learning materials and their wrong use.

**Ho3.** There is no significant difference between the number of children’s accidents reportedly due to inadequate supervision by teachers and children’s rough-play/indiscipline.

**Ho4.** There is no significant difference between the number of accidents reported to occur among children in public pre-schools and those in private pre-schools.

**Ho5.** There is no significant difference between the number of children’s accidents reportedly due to poor condition of the play-space/equipment in the play environment, use of inadequate/ wrong use of classroom learning materials in the learning environment and human errors related to inadequate supervision by teachers and children’s rough-rough play/indiscipline.
CHAPTER FOUR
DATA ANALYSIS RESULTS

4.1 Methods of Data Analysis

Data collected were coded, organized and analysed using both quantitative and qualitative methods. For quantitative data, inferential and descriptive statistics were employed, whereby data were summarized using frequency tables, percentages, averages and graphical presentations indicating the relationship between accidents and their causes. Qualitative analysis involved describing and explaining the information on causes of accidents as obtained during gathering of the data. For testing $H_0_1$ to $H_0_2$, One-way Anova technique was used. One-way Anova was appropriate for use because the grouped sampled responses from the various factors causing accidents as reported by teachers and parents were unequal. Results from the schools, teachers and parent's descriptive and inferential statistics are presented below.

4.2 Descriptive and Inferential Data Analysis

The descriptive and inferential data were organized along: teacher/parent information based on the study objectives. Presented first, is the schools', teachers' and parents' demographic information.

4.2.1 Demographic Information on Schools, Teachers and Parents

In order to obtain information on the causes of accidents to children, schools, teachers and parents were used in the study (see their distribution Table 3.1). Out of the 112 teachers interviewed 93 (83%) were from private schools and 16 (14.3%) from public, while 3(2.7%)
failed to attend interview. A total of 303 (90.2%) parents out of 336, responded to and returned the written questionnaires sent to them.

4.2.2 Teachers’ Educational Background, Professional Training & Gender

Teachers’ educational level and training are crucial aspects that help to enhance the teachers’ skills in the provision of child safety as well as care and as such the teachers were asked to provide this important information (see Table 4.1)

Table 4.1 Distributions of Teachers by Educational Background, Professional Training and Gender

<table>
<thead>
<tr>
<th>Teachers Academic Level &amp; Professional Training</th>
<th>No. of Teachers</th>
<th>No. of Teachers’ by Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Primary School &amp; Trained</td>
<td>07</td>
<td>6.3</td>
</tr>
<tr>
<td>Secondary School &amp; Trained</td>
<td>97</td>
<td>86.6</td>
</tr>
<tr>
<td>Sec. School &amp; in training</td>
<td>02</td>
<td>1.8</td>
</tr>
<tr>
<td>University Trained Graduates</td>
<td>03</td>
<td>2.7</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>03</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>100</td>
</tr>
</tbody>
</table>

Out of the 109 teacher respondents 107 were professionally trained teachers while 2 were still undergoing training. On academic level, 99 (88.4%) had secondary education, seven (6.3%) had primary level education while three (2.7%) were university graduates. Female teachers accounted for 106 (94.6%) and the males were three (2.7%).
4.2.3 Teachers' Age Bracket and Marital Status

The teachers' maturity level indicated by age and or marital status contributes to their ability to take good care of the children, which ultimately enhances the reduction of accidents, and were therefore attributes considered in the study (see Table 4.2 below).

### Table 4.2 Distributions of Teachers by Age and Marital Status

<table>
<thead>
<tr>
<th>Teachers Age Bracket</th>
<th>No. of Teachers</th>
<th>Teachers Marital Status</th>
<th>No. of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
</tr>
<tr>
<td>Below 20 years</td>
<td>00</td>
<td>0.0</td>
<td>Married</td>
</tr>
<tr>
<td>21-29 years</td>
<td>57</td>
<td>50.9</td>
<td>Single</td>
</tr>
<tr>
<td>30-39 years</td>
<td>43</td>
<td>38.4</td>
<td>Divorced</td>
</tr>
<tr>
<td>40-49 years</td>
<td>07</td>
<td>6.3</td>
<td>Non Respondents</td>
</tr>
<tr>
<td>Above 50 years</td>
<td>02</td>
<td>1.8</td>
<td>Total</td>
</tr>
</tbody>
</table>

Out of the 109 teacher respondents, there were none below 20 years as 57 (50.9%) were between 21 and 29 years, 43 (38.4%) 30 to 39 years, 7 (6.3%) 40 to 49 years and 2 (1.8%) above 50 while 62 (55.4%) of them were married, 46(41.1%) single and 1(0.9%) divorced.

4.2.4 Relationship of Caregivers to Children

The relationship of caregivers to the children was an important aspect considered (Table 4.3 below). Parents generally worry about their children’s safety and were in a good position to follow up and also report on any cases of accidents reported to them.

### Table 4.3 Distributions of Caregivers by Relationship with Children

<table>
<thead>
<tr>
<th>Relation</th>
<th>Number of Caregivers Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td>275</td>
<td>81.8</td>
</tr>
<tr>
<td>Step parent</td>
<td>22</td>
<td>6.5</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>39</td>
<td>11.6</td>
</tr>
<tr>
<td>Total</td>
<td>336</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 4.3 above indicates that among the 297 (88.4%) caregivers who responded, 275 (81.8%) of them were parents while, 22 (6.5%) were stepparents.

4.3 Reported Types of Common Accidents to Children in Pre-school

This section answers the 1st study objective meant to identify the types of common accidents to children in pre-schools and are presented in Figure 4.1 below.

Figure 4.1 Percent Types of Common Accidents Among Children Reported in Pre-schools Within Westlands Division

The double bars above represent teachers and parents' responses on injuries per type.

Key: 1. H/bites- human bites 2. F.B eyes- foreign body in eyes
3. F.B ears- foreign body in ears 4. L/bites- Insect bites
5. F.B nose- foreign body in nose
According to Figure 4.1, there were 14 different types of accidents reported by teachers and parents. The types of accidents according to teachers and parents respectively were bruises at 1245 (37.9%) and 657 (45.8%), swellings at 572 (17.5%) and 179 (12.5%), human bites at 486 (14.8%) and 124 (8.6%), cuts/stubs at 390 (11.9%) and 211 (14.7%), foreign bodies in eyes at 216 (6.6%) and 57 (4.0), insect bites at 100 (3.0%) and 59 (4.1%), choking at 87 (2.7%) and 33 (2.3%), Sprains at 46 (1.4%) and 24 (1.7%), foreign bodies in ears at 39 (1.2) and 24 (1.7%), fractures at 33 (1.0%) and 20 (1.4%), burns/scalds at 12 (0.4%) and 11 (0.8%), poisoning at 11 (3%) and 3 (0.2%). In overall, there were a total of 3277 accidents reported by teachers and 1445 by parents.

4.4 Reported Accidents Occurring at Different Times in Pre-school

The section below answers objective 2 on accidents, to children at different times in pre-school. Children’s activities while in pre-school can be broadly divided into indoor and outdoor. Indoor activities include classroom-learning, meal and resting/sleeping times while outdoor activities are toileting and play time. During these times, teachers’ responses on the occurrence of children’s accidents at different times were rated between very high and very low and are presented in Figure 4.2 below.
Figure 4.2 Percent Distribution of Reported Accidents Among Children at Different Times in Pre-schools in Westlands Division

Figure 4.2 shows the general pattern of accidents during different times when only medium responses are considered. During outdoor play time 48 (42.9%) teachers indicated accidents to be very high, toilet time was ranked 2nd or high at 32 (28.6%), class time 3rd or (medium) at 14 (12.5%), mealtime 4th or (low) 11 (3.6%) and resting/sleeping time 5th or very low with 04 (3.6%). Overall responses however during indoor time, show 66 (58.9%) teachers out of 109 reported accidents to be very low. Specifically at class learning time it was indicated that accidents were low 25 (22.3%), 16 (14.3%) medium, and 2 (1.8%) high. During meals, 77 (68.8%) teachers reported accidents to be very low, 17 (15.2%) low, 11 (9.8%) medium, 3 (2.7%) high and 1 (0.9%) very high. At sleeping time, 90 (80.4%) teachers, indicated very low accidents, 15 (13.4%) low, and 4 (3.6%) medium. During outdoor toilet time, 24 (21.4%) indicated accidents to be very low, 44 (39.3 %) low, 32 (28.6 %) medium, 4 (3.6 %) high and 5 (4.5 %) very high. During play time, out of 109 teacher respondents, 1 (0.9%) indicated
accidents to be very low, 12 (10.9 %) low, 48 (42.9 %) medium, 29 (25.9 %) high and 19 (17.0 %) very high.

4.5 Specific Causes of Reported Accidents to Children in Pre-schools

This section, presents both descriptive and inferential statistical results on all the total types of accidents that occurred due to specific factors in the outdoor play environment, indoor classroom learning environment and human error, based on the 3rd-6th objectives.

The results are presented in Tables 4.6 to 4.18 and Figure 4.4.

Figure 4.3 Specific Causes of Reported Accidents in Pre-schools

Figure 4.3 above shows the reported factors that caused accidents in the play environment are poor condition of play space and poor condition of play equipment. In the classroom-learning environment, the factors were inadequate and wrong use of learning material while teacher’s inadequate supervision of children and children’s rough play/indiscipline were human factors that caused accidents.
4.5.1 Accidents Reportedly Due to Factors in the Play Environment

From Figure 4.3, both teachers and parents reported poor condition of play space as the main cause of accidents in the play environment. Out of 109 teachers (17%), of them reported poor condition of play space as the highest contributor compared to (7%) by parents. Poor condition of play equipment as a cause of accidents in children was indicated by almost an equal number of teachers and parents (10%). Inferential statistics were further used to test $H_{01}$ which states, "There is no significant difference in the number of children's accidents reportedly due to the poor condition of the play-space and play equipment in the pre-school play environment" at alpha level 0.05 using One-way Anova (Table 4.4).

Table 4.4 Accidents Reportedly Due to Factors in the Play Environment

<table>
<thead>
<tr>
<th>Source</th>
<th>Teachers Type III Sum Of Squares</th>
<th>Teachers df</th>
<th>Teachers Mean Square</th>
<th>Teachers F</th>
<th>Teachers Sig.</th>
<th>Parents Type III Sum Of Squares</th>
<th>Parents df</th>
<th>Parents Mean Sq.</th>
<th>Parents F</th>
<th>Parents Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>4326.486</td>
<td>110</td>
<td>39.332</td>
<td>4.536</td>
<td>.000***</td>
<td>599.343</td>
<td>304</td>
<td>1.972</td>
<td>3.409</td>
<td>.000***</td>
</tr>
<tr>
<td>Rep</td>
<td>2296.385</td>
<td>108</td>
<td>21.263</td>
<td>2.452</td>
<td>.000***</td>
<td>467.297</td>
<td>302</td>
<td>1.547</td>
<td>2.676</td>
<td>.000***</td>
</tr>
<tr>
<td>Play Envi.</td>
<td>37.986</td>
<td>1</td>
<td>37.986</td>
<td>37.986</td>
<td>.039*</td>
<td>6.343</td>
<td>1</td>
<td>6.343</td>
<td>10.968</td>
<td>.001***</td>
</tr>
<tr>
<td>Error</td>
<td>936.514</td>
<td>108</td>
<td>8.671</td>
<td>8.671</td>
<td>.578</td>
<td>174.657</td>
<td>302</td>
<td>1.547</td>
<td>2.676</td>
<td>.000***</td>
</tr>
<tr>
<td>Total</td>
<td>5263.000</td>
<td>218</td>
<td></td>
<td></td>
<td></td>
<td>774.000</td>
<td>606</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sign. = P ≤ 0.05  * = 0.05  *** = 0.001

Table 4.4 shows there was a significant relationship (P=0.000), which was far above the specified 0.05 between accidents and the play environment according to teachers and parents responses. On the specific factors within the play environment, responses by teachers were very significant (P=0.039), with poor condition of play space contributing more accidents by mean (3.4) followed by play equipment (2.6). Parents’ responses were also very highly significant.
(P=0.001), with poor condition of play equipment contributing most accidents by mean (0.6) followed by play space (0.4). Teacher’s responses for play environment shows a significant difference between the number of children’s accidents due to the poor condition of the play-space and play equipment, with F-value of 4.381, (Table 4.5) which was greater than the critical F-value of 3.92. Similarly, parents’ responses had F-value of 10.968, which was also greater than the critical F-value of 3.84. H₀₁ was therefore rejected at alpha value 0.05 in favour of the alternative one which states that, “There is a significant difference between the number of children’s accidents reportedly due to the poor condition of the play-space and play equipment in the pre-school play environment”.

4.5.2 Accidents Reportedly Due to Factors in the Learning Environment

The study examined inadequate and wrong use of learning materials in the learning environment where both teachers and parents appear to agree that most accidents were caused by wrong use of learning materials by children, compared to use of inadequate learning materials, (Figure 4.3). Out of 109 teachers 14% reported wrong use of learning materials as the highest contributor of accidents compared to 10% for use of inadequate learning materials. Of the 303 parents, 16% pointed to wrong use of learning materials compared to 14% for use of inadequate learning materials. Inferential statistics were also used to test H₀₂ which states, “There is no significant difference between the number of accidents to children reportedly due to inadequate and wrong use of the indoor classroom learning materials in pre-school” at significant level 0.05 using One-way Anova. The results are presented in Table 4.5 below.
Table 4.5 Accidents Reportedly Due to Factors in the Learning Environment

<table>
<thead>
<tr>
<th>Source</th>
<th>Teachers</th>
<th>Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type III</td>
<td></td>
</tr>
<tr>
<td>Sum Of Squares</td>
<td>df</td>
<td>F</td>
</tr>
<tr>
<td>Model</td>
<td>2894.532*</td>
<td>110</td>
</tr>
<tr>
<td>Rep</td>
<td>1526.275</td>
<td>108</td>
</tr>
<tr>
<td>Learning Envi.</td>
<td>40.532</td>
<td>1</td>
</tr>
<tr>
<td>Error</td>
<td>769.468</td>
<td>108</td>
</tr>
<tr>
<td>Total</td>
<td>3664.000</td>
<td>218</td>
</tr>
</tbody>
</table>

Sig. = P ≤ 0.05
* = 0.05
*** = 0.001

Table 4.5 above shows very high significant relationship between accidents and the factors in the learning environment according to teachers and parents responses (P=0.000) which was far above 95% confidence level. For the specific factors in the learning environment, responses by teachers were very significant (P=0.019) with wrong use of classroom learning materials contributing more accidents by mean (2.8) followed by inadequate use of classroom materials (2.3). However, parents' responses were not (P=0.093) when compared to alpha value of 0.05, with wrong use of classroom learning materials contributing most accidents by mean (0.6) followed by use of inadequate classroom learning materials (0.5). The teachers’ responses show a significant difference between the number of accidents to children due to inadequate and wrong use of the indoor classroom learning materials with an F-value of 5.689, which is greater than critical F-value of 3.92. However, parents’ response had F-value of 2.835, which is not greater than critical F-value of 3.84.

Based on the above results from teachers’ responses H₀₂ which states, “There is no significant difference between the number of accidents to children reportedly due to inadequate and wrong
use of the indoor classroom learning materials in pre-school”, was rejected. However, parent’s results show that there is no significant difference between the number of accidents due to inadequate and wrong use of the indoor classroom learning materials, and therefore $H_{02}$ above was accepted.

### 4.5.3 Children’s Accidents Reportedly Due to Human Error

The study also examined the human error factor. Specifically, supervision of children by teachers and children’s rough play/indiscipline were the key factors. As Figure 4.3 shows, rough play/indiscipline was the major cause of accidents to children in the pre-schools sampled followed by teacher’s inadequate supervision of children according to both teachers and parents. Inferential statistics were used, to test $H_{03}$ below which states, “There is no significant difference between the number of children’s accidents reportedly due to inadequate supervision by teachers and children’s rough-play/indiscipline in pre-schools” at alpha level 0.05 (Table 4.6).

<table>
<thead>
<tr>
<th>Table 4.6 Accidents Reportedly Due to Human Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anova</td>
</tr>
<tr>
<td>Source</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Model</td>
</tr>
<tr>
<td>Rep</td>
</tr>
<tr>
<td>Error</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Sig. = $P \leq 0.05$  
*** = 0.001  

48
As Table 4.6 shows there was a significant relationship \( (P=0.000) \), which was far above the specified 0.05, between accidents and human error as well as for the specific factors according to teachers and parents. Children's rough play/indiscipline contributed most accidents by mean (5.7 and 1.7) followed by inadequate supervision (3.6 and 0.9) respectively. Both F-values (18.394) for teachers' responses were also greater than critical F-value of 3.92 and those of parents' F-value (69.177) compared to critical F-value of 3.84. \( H_0 \) was therefore, rejected in favour of the alternative one that states, "There was a significant difference between the number of children’s accidents due to inadequate supervision by teachers and children’s rough-play/indiscipline in pre-school".

4.5.4 Accidents Reported to Occur in Public and Private Pre-schools

A comparison between accidents reported to occur in public and private pre-schools was made in objective 6. \( H_0 \) which stated "There is no significant difference in the number of accidents, reported to occur among children in public pre-schools and those in private" was also tested with the aim of drawing valid conclusions on the fate of children and is presented in Table 4.7 and 4.8 respectively.

Table 4.7 Distribution of Reported Accidents by Category of Pre-school

<table>
<thead>
<tr>
<th>Category of School</th>
<th>No. of Teachers</th>
<th>No. of accidents Reported by Teachers</th>
<th>No. of Parents</th>
<th>No. of accidents Reported by Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Private</td>
<td>93</td>
<td>83.0</td>
<td>2851</td>
<td>87.1</td>
</tr>
<tr>
<td>Public</td>
<td>16</td>
<td>14.3</td>
<td>422</td>
<td>.12.9</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>03</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>100.0</td>
<td>3273</td>
<td>100.0</td>
</tr>
</tbody>
</table>
According to Table 4.7, 93 teachers and 257 parents from private pre-schools reported different types of accidents in children while 16 teachers and 46 parents were from public pre-schools. There were 2851 accidents reported from private pre-schools by teachers and 1251 by parents, while in public there were 422 and 183 respectively.

H0 below which states, "There is no significant difference in the number of accidents, reported to occur among children in public pre-schools and those in private" was tested at alpha level 0.05 level (Table 4.8).

As Table 4.8 shows there was a very high significant relationship (P=0.000) which is far above 95% confidence level, between accidents and the place of occurrence (schools) according to both teachers and parents with private pre-schools on the lead with most accidents by a mean of (30.3 and 4.4) compared to public pre-schools (23.4 and 3.4) respectively. Results from both teachers and parents, also brought out significant differences of accidents that occurred in the two categories of schools. Teachers’ responses had F-value of 102.098, which is greater than the
critical F-value of 3.92 while those of parents had F-value of 135.052, which is similarly much greater than the critical F-value of 3.84. \( H_0 \) was therefore rejected in favor of the alternative one that states, “There is a significant difference in the number of accidents reported to occur in public and those in private pre-schools”.

4.5.5 Reported Accidents According to Children’s Gender

In objective 7, teachers and parents were asked to indicate the child’s gender so that it could be established how many accidents occurred to the children according to sex (Table 4.9).

<table>
<thead>
<tr>
<th>Children’s Gender</th>
<th>No. of Children Frequency</th>
<th>No. of Accidents By Gender According to Teachers Frequency</th>
<th>No. of Accidents By Gender According to Parents Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>164</td>
<td>2152</td>
<td>753</td>
</tr>
<tr>
<td>Female</td>
<td>137</td>
<td>1125</td>
<td>392</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>336</td>
<td>3277</td>
<td>1145</td>
</tr>
</tbody>
</table>

Table 4.9 above shows the gender of injured children within the pre-school. The total number of boys was 164 (48.8%) and girls 137 (40.8%). According to teachers there were 2152 (65.6%) injured male children compared to 753 (65.8%) reported by parents and 1125 (34.3%) females compared to 392 (34.2%) respectively.

4.5.6. Treatment Reportedly Given to Injured Children in Pre-school

This section, answers objective 8 in which teachers and parents were required to indicate whether injured children received any form of treatment after getting hurt which ultimately promoted their healing. Their responses are summarised and presented in Table 4.10 below.
Table 4.10 Distribution of Reported Accidents by Treatment

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Teachers Who Gave Treatment</th>
<th>Parents Aware of Such Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>107</td>
<td>95.5</td>
</tr>
<tr>
<td>No</td>
<td>02</td>
<td>1.8</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>03</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>100.0</td>
</tr>
</tbody>
</table>

From Table 4.10 above, 107 (95.5%) teacher respondents out of 109 administered first aid treatment to the injured children. Out of the 303 parent respondents, 199 (59.2) of them indicated that their children had received first aid treatment in school and that some received further treatment at home and in hospital (Table 4.11 below).

Table 4.11 Distribution of Reported Accidents by Venue of Treatment

<table>
<thead>
<tr>
<th>Venue of Treatment</th>
<th>Number of Injuries in Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
</tr>
<tr>
<td>Hospital</td>
<td>52</td>
</tr>
<tr>
<td>School</td>
<td>147</td>
</tr>
<tr>
<td>Home</td>
<td>82</td>
</tr>
<tr>
<td>Other (Not Treated)</td>
<td>22</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>336</td>
</tr>
</tbody>
</table>

From the results, 303 parents showed that their children received treatment as follows: A total of 52 (15.5%) children were treated in hospital, 147 (43.8%) received first aid in school, 82 (24.4%) at home and 22 (6.5%) did not require treatment at all.
4.5.7 Accidents Reportedly Due to Combined Factors in the Play Environment, Learning Environment and Human Error

In objective 9 the study compared the number of children’s accidents in pre-schools due to the factors in the play environment, learning environment and human error and significance tests also conducted.

H0, below which states, “There is no significant difference in the number of children’s accidents reportedly due to the factors in the play environment, learning environment or human error in pre-school” was tested at alpha level 0.05 (Table 4.12).

Table 4.12 Accidents Reportedly Due to combined Factors in the Play Environment, Learning Environment and Human Error

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum Of Squares Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Type III Sum Of Squares df</th>
<th>Mean Sq.</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>25666.171</td>
<td>111</td>
<td>231.227</td>
<td>8.573</td>
<td>.000***</td>
<td>5015.924</td>
<td>305</td>
<td>16.446</td>
</tr>
<tr>
<td>Rep</td>
<td>9350.080</td>
<td>108</td>
<td>86.575</td>
<td>3.210</td>
<td>.000***</td>
<td>2284.502</td>
<td>302</td>
<td>7.565</td>
</tr>
<tr>
<td>Combined Fact.</td>
<td>1190.171</td>
<td>2</td>
<td>595.086</td>
<td>22.064</td>
<td>.000***</td>
<td>553.591</td>
<td>2</td>
<td>276.79</td>
</tr>
<tr>
<td>Error</td>
<td>5825.829</td>
<td>216</td>
<td>26.971</td>
<td></td>
<td></td>
<td>1587.076</td>
<td>604</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>31492.000</td>
<td>218</td>
<td></td>
<td></td>
<td></td>
<td>6603.000</td>
<td>606</td>
<td>2.628</td>
</tr>
</tbody>
</table>

Sig. = P ≤ 0.05

Table 4.12 shows a very high significant relationship (P=0.000), which was far above 0.05, between accidents and the three independent variables as well as each specific factor according to teachers and parents, with human errors contributing the most accidents by mean (9.4 and 2.6) respectively. Play environment according to teachers was next (6.0) followed by learning environment with a mean of (4.9), while according to parents, class environment was next (1.1).
and play environment last with a mean of (0.9). Teachers’ responses had F-value of 22.064, greater than the critical F-value of 3.07 while the parent’s response had F-value of 105.342, which is similarly greater than critical F-value of 3.00. H0, was therefore rejected in favour of the alternative one, which states, “There is a significant difference in the number of children’s accidents reportedly due to the factors in the play environment, learning environment and human error in pre-school”.

To determine precisely what position each of the factors occupied in causing accidents, further tests were conducted using the Duncan’s Multiple Range Test (DMRT) in Table 4.13.

Table 4.13 Duncan’s Multiple Range Test for Accidents Reportedly Due to Factors in The Play Environment, Learning Environment and Human Error

<table>
<thead>
<tr>
<th>Source</th>
<th>Teacher’s Views</th>
<th>Parent’s Views</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Subset 1</td>
</tr>
<tr>
<td>Class Environment</td>
<td>109</td>
<td>4.9358</td>
</tr>
<tr>
<td>Play Environment</td>
<td>109</td>
<td>6.0459</td>
</tr>
<tr>
<td>Human Errors</td>
<td>109</td>
<td>.185</td>
</tr>
<tr>
<td>Sig.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.13 above shows that accidents in the play environment and learning environment are in subset 1 while human error is in subset 2 on its own which indicates that it was the highest and very highly significant contributor of accidents with a significance value of (1.000) by both teachers and parents.
4.5.8 Other Peculiar Causes of Children’s Accidents Reported

In concluding the section on specific causes of accidents to children in pre-schools, teachers and parents were asked to indicate any other peculiar cause of accidents that children might have experienced and these are presented in Table 4.14 below.

Table 4.14 Distribution of Children’s Accidents by Other Causes

<table>
<thead>
<tr>
<th>No. of Accidents</th>
<th>No. of Times Per Teacher Respondents</th>
<th>No. of Times Per Parent Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>00</td>
<td>108</td>
<td>96.4</td>
</tr>
<tr>
<td>01</td>
<td>01</td>
<td>9.9</td>
</tr>
<tr>
<td>02</td>
<td>00</td>
<td>0.0</td>
</tr>
<tr>
<td>03</td>
<td>00</td>
<td>0.0</td>
</tr>
<tr>
<td>Non Respondents</td>
<td>03</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Other causes of accidents according to teachers included 1 case of a child whose finger was trapped by the car door at the school’s car park and 16 cases reported by 13 parents. The accidents were attributed to beatings from older primary school children self-imposed injuries by an autistic child and bad luck respectively see Table 4.14 above.
4.5.9 Reported Impact of Accidents to Children in Pre-School

The main impact of accidents presented in objective 10 was absenteeism from school. Figure 4.4 shows the responses from both teachers and parents.

**Figure 4.4 Absent Children Reportedly Due to Accidents**

As Figure 4.4 above shows, more teachers than parents confirmed that accidents had contributed to children’s school absenteeism. Parents however, appeared to dispute children’s absenteeism due to accidents, with only 27.7% agreeing with teachers.

The next chapter covers discussion, conclusion and recommendations.
CHAPTER FIVE
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion and Implications of the Findings

5.1.1 Discussion

a) Demographic Information on Schools, Teachers and Parents

Parents and teachers are the primary custodians of children and they are better placed to know and report about accidents affecting the children (Table 4.1). It was encouraging to note that the response rates from teachers' and parents' questionnaires were 97.3% and, 90.2% respectively, which was far above 75%. Most teachers sampled were trained and it was not possible to tell whether the results would have been different if majority of them had been untrained. However, Gumo (2003) reveals that the teachers' level of training is related to their performance. It is therefore anticipated that accidents would have been higher if more untrained teachers had been sampled.

b) Teachers’ Age Bracket and Marital Status

Although most teachers were in the early and middle ages thus mature and capable to offer adequate safety care to children as Table 4.2 shows, this was not quite evident from the results because there was a high occurrence of accidents observed. There could therefore be other underlying psychological factors contributing to accidents such as de-motivation and stress among others, which could have contributed to the high occurrence of accidents in this study and observed by (Stoppard 2001; Waithaka 2003).

c) Relationship of Caregivers to Children

In many cases, parents reported lower figures than those by teachers, which, may mean that some parents were not fully aware of any injuries their children might have sustained in school (Table 4.3).
This calls for their active engagement in their children’s well being which would be an added challenge to the school authorities to ensure maximum safety for children in school and hence the reduction of accident situations. Gumo (2003) shows the importance of parents’ contributing towards pre-schools’ well being through their resourcefulness.

d) Occurrence of Accidents By Children’s Gender

The results in Table 4.12 show that there was slight gender bias towards male injured children with 2152 (65.6%) boys reported by teachers compared to 753 (65.8) by parents while girls were 1125 (34.3%) compared to 392 (34.2) respectively (Figure 4.2). This could be due to cultural upbringing as observed by Ezewu (1983) and Seifert et. al. (1987) that requires girls to avoid risky encounters while boys were left to explore their surrounding. All the same, accidents in all children regardless of gender should be kept on the minimal.

5.2 Types of Common Accidents to Children in Pre-school

The results from Figure 4.1 by teachers and parents show that the more common accidents were bruises, swellings, human-bites and cuts/stubs, all of which contributed between 12% to 38% (reported by teachers) and 8% to 46% (reported by parents). Other types of accidents accounted for less than 5%. The main reason could be inadequate supervision, which concurs with (Stoppard 2001) on children’s rough play/indiscipline, which usually leads to falls and consequently bruises. Swellings could possibly be because of children banging into one another or objects which concurs with Kamel et. al. (1999) where collisions were a high cause of accidents. Teachers could therefore assist in reducing these accidents through strict supervision of children, encouraging safe practices in children
such as not running round corners or over crowding and ensuring that they keep their eyes on children at all times, all of which Stoppard (2001) and K.I.E (1994) have pointed out could lead to accidents. Further efforts were made to find out the occurrence of accidents at different times in pre-school.

5.3. Occurrence of Children’s Accidents at Different Times in Pre-school

Accidents were highest during out door playtime followed by toilet time, class time, mealtime and very low at resting time. During indoor activities, accidents were very low, between 58.9% and 80.4% compared to 21.4% and 0.9% in outdoors respectively (Figure 4.2). By considering, “very low” and “low” to represent the unlikelihood of accidents occurring, 69.4% of teachers indicated accidents were rare during indoor activities, compared to 11.7% for outdoor. Those who indicated “high” and “very high” likelihood of accidents were 1.5% and 0.3% for indoor compared to 14.8% and 10.8% for outdoor respectively. Moderate occurrence of accidents was reported by 9.2% for indoor and 35.8% for out-door. The reasons for the very low number of accidents during indoor class learning time could be the fact that there was limited chance to move around in the classroom compared to outdoor activity time. This concurs with K.I.E. (1990) where children were allowed enough space and freedom to move about freely. At resting time low accidents also prevailed probably because children were already tired and with little activity that could lead to accidents while asleep. According to teachers and parents reports, accidents during toilet time were also low and those that occurred were caused due to children pushing one another or competing to be on the lead. The root cause of the problem points to indiscipline, which Olembo and Wanga (1992) indicate must be checked in school.
Accidents during playtime, however, increased remarkably with 42.9% reported to be moderate, 25.9% high and 17% very high. The reason could be that, as children explore the uncontrolled environment, they are likely to encounter different causes of accidents. Nevertheless, with proper supervision (Stoppard, 2001) the high accident prevalence even during active play can be avoided or reduced. With the types of accidents to children in Westlands division pre-schools identified as well as specific times when they most occurred, plans to establish their causes were now possible.

5.4 Specific Causes of Accidents to Children in Pre-schools

5.4.1 Accidents Due to Factors in the Play Environment

As Figure 4.3 shows, more accidents occurred due to the poor condition of play space followed by their inadequate use according to teachers although the parents results indicated the reverse. Inappropriate fencing and sharp objects in the play space were cited as factors that contribute to accidents in this study, which is consistent with K.I.E. (1995). The pre-school management should be aware of these factors in order to minimize accidents in children. Poor condition of play equipment as a cause of accidents in children was also indicated by almost an equal number of teachers and parents (10%). The study findings are also consistent with Stoppard (2001), who shows poor condition of play facilities as one of the factors that contribute to accidents.

The disparity between teacher and parent responses however, appears to suggest that parents are not well informed of their children's accidents. Teachers indicated more accidents due to poor condition of play space than by poor play equipment and since they are the main caregivers in school they are more likely to know the real causes of accidents compared to the parents. The
high number of accidents due to poor conditions of play space which Stoppard (2001) also observed, means that pre-school management needs to invest greatly in terms of energy, time and necessary resources to make the play space more even, remove stones and other sharp objects.

The probable reason for comparable responses from teachers and parents on accidents due to the poor condition of play equipment unlike by poor condition of play space could be that they were well managed, or kept out of use if broken and consistent with what K.I.E. (1995) revealed. Pre-school authorities therefore need to take action to rectify the poor condition of play space, which has been confirmed to cause accidents in the play environment as indicated by both teachers and parents.

5.4.2 Accidents Due to Factors in the Learning Environment

Accidents due to inappropriate or misuse of learning materials as expressed by teachers and parents is a factor that teachers need to be aware of always. Wrong use of pencils, crayons, knitting needles and scissors are some of the common tools used in learning that contributed to accidents. From the teachers’ reports, it was indicated that teachers should improve on their instructional methods to children. There is also need for individual attention to ensure that each child was able to handle learning materials correctly as demonstrated or instructed. Indiscipline was also reported as a cause of accidents, which is consistent with what Olembo and Wanga (1992) show, that children’s discipline should be checked in order for order to prevail in school. Misuse of learning materials by inserting them into body parts, also led to accidents, which
concurred with Obara (1998) who further shows that such actions, could lead to obstruction and instant death.

Inadequate learning materials though not given much prominence by teachers and parents reports indicated that they resulted in children fighting for the few available ones at times leading to accidents and is consistent with Stoppard (2001). Teachers need to be aware of the fact that pre-schoolers could easily fight for materials due to their mental characteristics. Piaget (1984) revealed that pre-schoolers are egocentric and have difficulty in sharing materials. However, they must be trained to share materials with others. Teachers also need to carefully plan how children can share inadequate learning materials. Parents learn about incidences of such shortages from teachers who may have a habit of asking children to take to school various materials from home such as pencils, exercise books and crayons among others. Failure to explain use of different learning materials and lack of demonstrating to children are also factors that teachers and parents reported which led to accidents.

5.4.3 Children’s Accidents Due to Human Error

Of the factors in human error, rough play/indiscipline among children, contributed to the most accidents but inadequate supervision by teachers as Stoppard (2001) states, could be the key factor. The study has shown the need to emphasize proper supervision by teachers to manage rough play/indiscipline among children. This could be done by ensuring a better teacher-child ratio, providing safety education to children, demonstrating/modelling safe behaviour and giving clear instructions as Beaver (1984), K.I.E:(1999), K.I.E (1992 b) and Bandura (1977) have shown. Adjustment problems in some children as explained by a number of teachers and
parents in their recommendations were also among the causes of accidents. Bennaars, Otiende and Boisvert (1994) have shown that adjustment problems could lead to aggressive behaviour. The effect could be a bad accident as in cases where children bit their colleagues thus inflicting wounds on them and should be checked.

The next cause of accidents according to both teachers and parents was inadequate supervision. It is ironical that more teachers reported inadequate supervision compared to parents, yet they are the ones charged with the responsibility of ensuring adequate supervision. Teacher’s inadequate supervision of children could be due to many factors, which include being paid their salaries late, imbalanced child-teacher ratio, stress and or psychological problems (Waithaka 2003; Stoppard 2001; K.I.E. 1992).

5.4.4 Accidents Due to Combined Factors in the Play Environment, Learning Environment and Human Error

According to the study results on the causes of accidents occurring to pre-school children each of the factors in the play environment, learning environment and human error, were examined at two levels. Human error and specifically rough play/indiscipline among children, were blamed for most accidents, followed by inadequate supervision of children by teachers. The play environment was next, followed by learning environment. The findings, agree with the Domino theory, which showed that accidents due to human error, account for 88% of their occurrence. The confirmation by teachers was therefore not surprising even though it appears to incriminate them because children’s rough play/indiscipline points to inadequate supervision by them. It is not clear how the results would have been if the study had sampled children and asked for their honest opinion on the causes of accidents among them. They would probably have blamed the
cause of accidents on lack of supervision. The reason why parents may have concurred with
teachers on rough play/indiscipline being the major cause of accidents could also be a case of
adult versus children syndrome and in such a case children would be the culprits.

The play environment which is the immediate area one sees on a visit to pre-school had the
factors play space and condition of the play equipment. Teachers were emphatic that the poor
condition of play space was responsible for more accidents than by poor condition of play
equipment. It may therefore be probable that the play equipment was well managed, kept out of
use if broken or its use controlled so as to minimise accidents as pointed out by K.I.E. (1992a).
Parents however depend on second hand information from children and a statement like “I fell
from the swing or was injured while sliding” would influence a parent’s view that there are
more accidents due to play equipment.

The factors in the learning environment were children’s wrong use of learning materials and use
of inadequate learning materials. Wrong use was responsible for more accidents, which tend to
raise some concern on teacher’s effectiveness in instructing children on correct use. Inadequate
learning materials on the other hand would result in children fighting for them hence increasing
the risk of accident. However, the fact that it did not cause more accidents could probably be
due to the assumption that all pre-schools sampled had adequate learning materials or the
teachers were good at organizing their use by the children thus restricting children from fighting
over them due to their egocentric nature as Piaget (1984) suggested.
5.4.5 Other Peculiar Causes of Children's Accidents

From Table 4.14 more parents than teachers reported some peculiar causes of accidents. The reason for few teachers noticing other causes of accidents could be due to the fact that some like the cut on the finger happened in the presence of the parent who should have taken full responsibility over the child. The children might also not have reported their case to the teachers. However, the teachers should be well informed about autistic or other children with special needs as observed by Seifert et. al. (1987) with the view to giving them extra attention. In pre-schools attached to primary schools, teachers should see to it that pre-schoolers are separated from older ones soon after entering the gate to avoid cases of young ones being beaten by older ones.

5.5 Accidents Occurring in Public and Private Pre-schools

Contrary to what the researcher had hypothesised, 2851 (87.1%) accidents were reported by teachers in private pre-schools and 422 (12.9%) parents compared to 1252 (87.2%) and 183 (12.8%) from public pre-schools respectively (Table 4.7). The higher number of accidents occurring in private pre-schools could probably be attributed to de-motivation of teachers as Waithaka (2003) suggests, which leads to decreased level of job satisfaction and non-effectiveness in their supervision role. The results further indicate that poor condition of play and learning facilities as well as use of inadequate learning materials caused a good number of accidents in both categories of schools and therefore pre-school authorities need to redouble their efforts in order to reduce the number of accidents recorded in the study.
5.6 Treatment Given to Injured Children

First aid treatment is an important gesture towards injured children, which makes them know that their teachers love, and care for them. It also helps promote children’s physical healing and also provides psychological relief which Erikson (1963) and Freud (1965) concur with. In line with the above, the results in Table 4.11 indicate that more than half the total number of teachers ensured that injured children received some form of treatment, which corresponds with what parents reported. It can therefore, be assumed that teachers put into practice the first aid skills they learnt during their training.

However, despite the attention towards injured children some accidents need not have occurred if adequate safety had been ensured as was expressed by some of the parents and teachers in their recommendations. The greatest challenge for teachers is therefore how to ensure preventable accidents do not occur to children at all in pre-schools.

5.7 Absenteeism in Children Due to Accidents

According to Figure 4.4, 74.1% teachers indicated accidents as a cause of children’s absenteeism. The results are also consistent with studies by Kamel et. al. (1999) where accident was a leading cause of absenteeism and therefore minimizing it would improve school attendance. Although parents also indicated accidents as being a cause of school absenteeism, their number was much lower than that by teachers. It is not clear why teachers related the cause of absenteeism to accidents while only a few parents conceded that their children were actually absent due to school injuries. However it may have been possible that the children could have reported that accidents were the cause of their absence. The contradiction from parents could also mean that some of them may be too busy with their personal engagements and were therefore not fully aware when their children were involved in some form of accident while in
pre-school. Parent’s active participation in their children’s well being while in pre-school is vital as Gumo (2003) noted and would challenge the school authorities to ensure maximum safety to children thus minimizing accidents.

5.8 Implications of the Findings

5.8.1 Magnitude of Accidents in Pre-schools

According to Figure 4.1, the study recorded 14 different types of accidents reported by both teachers and parents. The predominance of the first four types of accidents: bruises, swellings, cuts/stubs and human bites were noted from both teachers’ and parent respondents. However, depending on the extent of accident, these injuries may or may not have required the children to be attended to in hospital. Foreign bodies in the children’s eyes and insect bites could also be treated in the same way. In total, 3273 accidents in children were reported to have occurred by teachers and 1435 by parents.

The number of the above accidents raises concern because the wounds sustained from the injuries could cause infection leading to other secondary complications thereby making the healing process slow. Such cases may lead to school absenteeism in children and subsequently affect their academic performance. Falls and collision into objects, in many cases are the cause of bruises, swellings and cuts as indicated by Stoppard (2001) in children and therefore teachers need to curb down situations that could cause serious falls and bangs. Human bites, on the other hand, are caused during fights and are usually used by children for self-defence. They could also cause serious infection especially in this era of the acquired Immuno-Deficiency Syndrome (AIDS) and need to be checked. Apart from resulting in negative physical effects in children as
reported by teachers and parents, accidents also lead to psychological trauma due to the devastating situations that accompany them which Erikson (1963) and Freud (1965) concur with. Children should therefore be protected from accidents and particularly serious ones.

Other accidents that might have required children to be hospitalised such as sprains, fractures, burns/scalds and poisoning were few. Such accidents carry more weight when cost aspects, such as recuperation period and disruption in school attendance are considered and as much as possible should not be allowed to occur. The few numbers however, could also be an indication that those concerned were reluctant to report because of the implications it would bring on them. Parents may refrain from reporting such accidents of high magnitude because it would undermine their relationship or that of their children with the school authorities. The school management could also be reluctant to report because it could affect enrolment of new children, if would be clients and government authorities got to link frequent and severe accidents though to children's disadvantage. However, the lower number of sprains and fractures could also be due to the fact that young children are less prone to such accidents because their muscle/tendon flexibility is greater than in older children and their ossification not complete, which is consistent with what Meeks and Heit (1991) observed.

5.8.2 Accidents in Relation to Different Times in Pre-school

Figures 4.2 indicated very low levels of accidents during learning, meal and sleeping time. During these times children's activities were drastically reduced either by the alertness of the caregivers' supervision during learning or due to children themselves being actively engaged in feeding and sleeping. Once the trend of activities changed, the possibility of accidents increased
drastically from 36.7% to 85.8%. The increase of accidents at this time are related to factors reviewed in this study such as inadequate supervision of children by teachers, children’s indiscipline/rough play, poor condition of play space and equipment, poor condition and wrong use of learning facilities among others. The intensity of accidents during outdoor play, therefore points out the need for more safety care, during outdoor time where medium to very high accident cases occurred. Adequate supervision as reported by a number of teachers and parents in this study is a key factor in reducing accidents which is also consistent with the Domino Theory.

5.8.3 Causes of Accidents to Children in Westlands Division Pre-schools

Accidents in the above pre-schools were grouped according to three broad causes starting with the play environment, learning environment and those, which occurred due to human error. Both teachers and parents reported human error to be responsible for most accidents in pre-schools with 1038 and 802 cases respectively. Accidents reported in the play environment were 659 according to the teachers and 320 as per the parents, making it the second contributor to pre-school accidents. The third factor only contributed a small number towards total accidents. Out of 3273 accidents reported by teachers and 1435 by parents, in pre-schools, human error contributed the most with 66% and 58% cases respectively.

The statistical analysis appeared to point to a strong link between accidents in pre-schools and the places of occurrence but more so with the specific causes in each of the environment. From the study, human error played a significant role as a cause of accidents. Human errors studied in this thesis were inadequate supervision and children’s rough play/indiscipline. Children’s rough play/indiscipline are particularly the main concerns in this study. The Anova Table 4.6 showed
very high significance levels (0.000) from both teachers and parents responses, when compared to play environment (0.039 and 0.001 in Table 4.4) and learning environment (0.019 and 0.093 in Table 4.5). In addition, Table 4.13 on the Duncan’s Multiple Range Test (DMRT) further indicates human error to be the highest contributor of accidents with a mean of (9.0 and 3.0) from teachers and parents respectively, compared to (6.0 and 1.0) on play environment and (5.0 and 1.1) on indoor classroom environment. This observation based on the teachers and parent’s information strongly agrees with the Domino Theory, which stated that up to 88% of the accidents were due to human factors and 10% by physical conditions. Best (1963) however emphasises the need for prevention rather than cure and armed with the new findings, plans for post-accident care are important while considering the steps necessary for the prevention of accidents to children in pre-schools.

5.8.4 Post Accident Care

Teacher respondents appeared to be conversant with post accident care necessary to reduce suffering in children, with 95.5% having administered first aid (Table 4.10). The initiative appeared to tally with the 43.8% cases attended to in the school compound with 15.5% being referred to hospitals for further attention. Considering the prevalence of accidents, it is crucial to ensure pre-school teachers received up-to-date safety care training so as to ultimately minimise the effects. The importance of first aid cannot be over emphasised due to its contribution towards the child’s physical as well as psychological well being as Erikson (1963) and Freud (1965) have shown. In view of the above implications, the following conclusions were made so as to come up with appropriate recommendations.
5.9 Conclusion

In conclusion, a decision to make some investment towards a safe learning pre-school environment by the school management, has greater benefit compared to the negative effects of accidents in children. Similar to the Domino Theory emphasis, the study points to the need to prevent accidents in children before they occur. This is the focus of the recommendations below.

5.10 Recommendations

5.10.1 Recommendations for Pre-School Teachers and Management Teams

a) Pre-school children should be supervised all the time during learning and play activities so that they do not engage in rough play/indiscipline, which caused most accidents. As much as possible, pre-school children should not be left alone because this gives them the freedom to get into mischief or unsafe kind of practices. If children are given maximum supervision, they will not get into any kind of indiscipline or rough play and accidents will be minimised.

b) Factors that may lead to inadequate supervision of children by teachers need to be addressed. Reviewed literature pointed out factors such as stress, fatigue, late payment of salary and incorrect teacher-child ratio which might de-psyche teachers against offering adequate supervision hence putting child-safety into jeopardy.

c) Pre-school’s play such as space and equipment should be in good condition to ensure safety. Unlevelled playgrounds coupled with sharp objects in the play space and broken play equipment are among the factors which, caused accidents in the play environment and consistent with Stoppard (2001) observation: It is therefore recommended that all children’s
play facilities should be in good order and regularly checked for splintage or breakage or kept out of use until it is repaired.

d) From teachers’ reports special needs children such as autistic children could also injure themselves and others. Teachers therefore need to be empowered on how to deal with them in order to minimise accidents. Pre-school personnel could benefit from regular training in handling all types of children in order to guard against such children injuring themselves or others.

e) Inadequate use of classroom learning materials in the learning environment was another factor causing accidents among the study findings. Pre-schoolers as Piaget (1984) revealed are egocentric and have difficulty in sharing materials and although they must be trained to share, teachers need to be aware of this fact and ensure adequate materials for children’s use.

f) Wrong use of learning materials such as inserting them into body parts, poking others with pencils or such materials as K.I.E. (1994) pointed out featured in the study. Teachers should therefore ensure adequate supervision so that children do not use materials wrongly thereby endangering themselves. They should also give children clear instructions on how to use them, demonstrate correct use of materials and reinforce children’s safe behaviour apart from teaching them safety education.

g) In order to ensure good management of children’s injuries, pre-school teachers should attend courses on first aid. Every pre-school should also have a first aid kit in order to ensure injured children receive appropriate help.

h) Motivation is a factor that could improve teachers’ performance as observed by Waithaka (2003). Efforts should be made to reward teachers whose children suffer the least number of
accidents per term or year as an incentive to motivate them to be more alert on their child supervision role.

5.10.2 Recommendations to Policy Makers

a) Accidents, affect children's holistic growth and development and as such, policy makers need to ensure routine safety check ups and general advise to schools on how to improve safety in as far as existing facilities and services require. This would make sure that proprietors of schools maintained the desired safety requirements.

b) It is also proposed that a policy guideline on child supervision be formulated. This could be effectively realised by ensuring that there is a proper teacher-child ratio. K.I.E. (1999) advocates for a teacher-child ratio of 1:25-30 for three to four year olds and 1:35 or less for five to six year olds and policy makers need to ensure that this requirement is upheld in order to curb down children's accidents.

5.10.3 Recommendations to Stakeholders

a) Parents and communities should supplement the teachers' efforts in teaching children safety education so as to minimize accidents due to human error. The study has shown the importance of teaching children safety education and ensuring discipline among other methods of minimising accidents.

b) Parents should also make the school authorities aware of unsafe facilities or conditions they saw within the school. This would impress upon the pre-school authorities on the need to ensure child safety all the time.
5.11 Suggestions for Further Research

a) The study on causes of accidents among pre-school children in Kenyan pre-schools was only done in Westlands Division of Nairobi Province. The study could be used as a basis for further research in other divisions, districts as well as provinces in Kenya.

b) Similarly, further research could be done, in private pre-schools to establish teachers’ level of job satisfaction in a bid to motivate them. Job dissatisfaction due to late payment of salaries was one of the factors in the studies reviewed that de-motivate teachers. Teachers with high levels of job satisfaction could thus work towards minimising accidents in children.

c) Further research could also be done on the prevention of accidents identified in the study and also their treatment.

d) The current study relied on teachers and parents’ reports. Another study could be done using observation method in order to look at actual reported types and causes of accidents thereby enriching the efforts to minimise accidents among pre-school children.
REFERENCES


APPENDICES

Appendix A: Questionnaire To Teachers Who Observed Accidents In Children At Pre-school.

Introduction

Hullo! I am a post graduate student at Kenyatta University, conducting a research on “Causes of accidents to children in pre-schools within Westlands Division and your pre-school has been chosen as one of the most appropriate to participate in the study. The purpose of this questionnaire is to find out the causes of accidents to children and the information will be used to promote the reduction of accidents in pre-schools. The questionnaire has two sections, A and B. Please kindly answer the questions as honestly as possible and all information will be kept confidential. Thank you for your co-operation.

A. Personal information (for teachers)

1. Form Number: ____________________________________________

2. Education background: Primary [ ] Secondary [ ]

                      [ ] College [ ] University [ ]

3. Gender: Male [ ] Female [ ]

4. Marital status: Married [ ] Single [ ] Divorced [ ]

5. Age bracket (Tick one as appropriate): Below 20 years [ ] (21-29) [ ] (30-39) [ ]

                   (40-49) [ ] Above 50 [ ]

B. Safety And Security Issues:

1. Do accidents occur to children in this pre-school? Yes [ ] No [ ]

2. If it is true that some accidents to children in pre-school do occur, is first aid administered after injury? Yes [ ] No [ ]
3. From no (2) above, could you please classify the rate of injuries per area of occurrence as high, high, medium, low or very low during the following activities:

<table>
<thead>
<tr>
<th></th>
<th>Very high</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Very low</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) During indoor learning:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>b) Meal time:</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>c) Sleep/resting time:</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>d) During toileting:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>e) During outdoor play:</td>
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</tbody>
</table>

4. Does the school keep a written record of the accidents? Yes [ ] No [ ]

5. Using the above record in no. (4) or from what you can remember, about how many times did any of these accidents occur to children in your school in the last 12 months? (Please write the actual number of times inside the bracket)

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) bruises</td>
<td>[ ]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) cuts/stubs</td>
<td>[ ]</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) fractures</td>
<td>[ ]</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) swelling</td>
<td>[ ]</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) sprain</td>
<td>[ ]</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>f) burns/scalds</td>
<td>[ ]</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) drowning</td>
<td>[ ]</td>
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<tr>
<td>h) poisoning</td>
<td>[ ]</td>
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<tr>
<td>i) choking</td>
<td>[ ]</td>
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<tr>
<td>j) human bites</td>
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<tr>
<td>k) insect bites</td>
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<tr>
<td>foreign bodies in:</td>
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<td></td>
</tr>
<tr>
<td>l) eye</td>
<td>[ ]</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>m) ear</td>
<td>[ ]</td>
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<tr>
<td>n) nose</td>
<td>[ ]</td>
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<tr>
<td>o) others: (please specify)</td>
<td>[ ]</td>
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</tbody>
</table>

6. Do the above effects of accidents cause absenteeism in children? Yes [ ] No [ ] Sometimes [ ]
7. About how many accidents you may have observed in your school in the last 12 months occurred to children due to any of the factors below? (Please write the actual number of times inside the bracket)

<table>
<thead>
<tr>
<th>Factors that caused accidents</th>
<th>Number of times factor caused accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Inadequate supervision of children</td>
<td>[ ]</td>
</tr>
<tr>
<td>b) Children’s rough play/indiscipline</td>
<td>[ ]</td>
</tr>
<tr>
<td>c) Poor condition of play space</td>
<td>[ ]</td>
</tr>
<tr>
<td>d) Poor condition of play equipment</td>
<td>[ ]</td>
</tr>
<tr>
<td>e) Inadequate classroom learning materials</td>
<td>[ ]</td>
</tr>
<tr>
<td>f) Wrong use of classroom learning materials.</td>
<td>[ ]</td>
</tr>
<tr>
<td>g) Others Please specify</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

8. What would you suggest to be the best way of reducing children’s accidents in your preschool?
Appendix B: Questionnaire To Parents Whose Children Sustained Injuries While In Pre-School.

Introduction

Dear parent,

I am a student at Kenyatta University where I am pursuing a master degree in education. My aim of contacting you is to let you know that I am conducting research on 'Causes of accidents to children in pre-schools in Westlands Division and your child’s school has been selected to participate in the study. Please kindly answer the questions below as honestly as possible and return the questionnaire to school within the next 7 days from today. The findings of the study will be used to improve safety of children in pre-schools within this division and the information will be treated confidentially. Thank you in advance for your co-operation and timely response.

A) Personal information

1. Form no: __________________________________________

2. Child’s Sex: Male [ ] Female [ ]

3. Relationship to child: Parent [ ] Guardian [ ]

B) Information about injuries the child sustained while in school

1. Has your child suffered any injury while in the school compound in the last 12 months? (Tick as appropriate)

   Yes [ ]

   No [ ]
2. From what you can remember, about **how many times** has your child suffered any of the accidents below in school during the last one year as reported to you by the teacher or child (Please write the actual number of times inside the bracket)

<table>
<thead>
<tr>
<th></th>
<th>a) bruise</th>
<th>b) cuts/stub</th>
<th>c) broken bone</th>
<th>d) twisted joint</th>
<th>e) burns/scalds</th>
<th>f) drowning</th>
<th>g) choking</th>
<th>h) human bites</th>
<th>i) insect bites</th>
<th>j) swelling</th>
<th>k) poisoning</th>
<th>l) foreign object in: ear</th>
<th>m) in nose</th>
<th>n) in eye</th>
<th>m) Others: Please specify</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

3. About **how many** accidents occurred to the child due to any of the factors below? (Please write the actual number of times inside the bracket)

<table>
<thead>
<tr>
<th>Factors that caused accident</th>
<th>Number of times factor caused accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Inadequate supervision of children</td>
<td>[ ]</td>
</tr>
<tr>
<td>b) Rough play/indiscipline</td>
<td>[ ]</td>
</tr>
<tr>
<td>c) Poor condition of play equipment</td>
<td>[ ]</td>
</tr>
<tr>
<td>d) Poor condition of play space</td>
<td>[ ]</td>
</tr>
<tr>
<td>e) Wrong use of classroom learning materials</td>
<td>[ ]</td>
</tr>
<tr>
<td>f) Fighting for inadequate classroom learning materials</td>
<td>[ ]</td>
</tr>
<tr>
<td>g) Others: Please specify</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
4. If any of the above injuries needed attention, was the child:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Treated in hospital</td>
<td>[ ]</td>
</tr>
<tr>
<td>b) Treated in school</td>
<td>[ ]</td>
</tr>
<tr>
<td>c) Treated at home</td>
<td>[ ]</td>
</tr>
<tr>
<td>d) Others: Please specify</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

5. After treatment, did you find it necessary for the child to rest at home to allow full recovery before going back to school?  
   Yes [ ]  
   No [ ]

6. What can you suggest to be done, to reduce accidents in your child’s school?