

A PROTOCOL ON FACTORS INFLUENCING SAFETY PRACTICES FOR INJURY PREVENTION AMONGST CHILDREN IN DAY-CARE CENTRES IN SELANGOR AND PUTRAJAYA, 2015

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ABSTRACT

Background: Childhood injuries have become one of the leading causes of morbidity and mortality amongst infants and pre-school children. With the increase in working mothers in the labour force, the demand for out-of-home child care in the form of day-care centres has risen substantially in recent years. Young children cannot understand the risk of injury and thus do not know how to be safe. It is therefore essential that child care settings not only offer a safe environment but also qualified staff members who are able to provide appropriate supervision. With the growing concern for the safety of children, this study is designed to identify factors that influence safety practices for injury prevention amongst children in licensed day-care centers in Malaysia.

Materials and Methods: A cross-sectional study design using cluster sampling method will be applied. Selected licensed day-care centers in Selangor and Putrajaya will be eligible to participate in the study. Regions with eligible day-care centres will be divided into clusters. A random number table will be used to select primary clusters. All caregivers in direct contact with children will be selected to participate. A sample size of 1178 caregivers is calculated, with participants including only full-time and part-time caregivers past their probation period of 1 month. The main instrument of measure will be a self-constructed standardized safety-checklist and questionnaire.

Conclusion: Results from this study can be used to increase awareness of the factors that influence safety practice amongst children in day-care centres. This knowledge will help identify areas that need focus and enforcement in order to reduce and eliminate the risk of future injuries amongst children in day-care centres.

Keywords: Safety practice, Children, Day-care Centres, Injuries, Prevention

1.0 Introduction

1.1 Background of the Study

Every child in the world deserves a right to a safe environment; protected from injury and violence (WHO, 2008). It is the responsibility of any facility or institution caring for a child to provide the necessary protection and care required, regardless of the level of difficulty in achieving this task (WHO, 2008). In spite of this, world-wide, approximately 2400 children die daily due to injury and violence (Peden et al, 2008). Additionally, in 2008, WHO reported that 50% of children suffering from unintended injuries ended up disabled. Research showed that in 1995, one in four children in the United States suffered from medically requiring injury (Scheidt 1995 as cited by Saluja et al, 2004). In the year 2009, Injury was also the known cause of death amongst children aged 1 to 4 in the United Kingdom (Office for National Statistics-ONS, 2009). Consequently injury ranks as one of the leading causes of morbidity and mortality amongst children, globally (Peden et al, 2008).

Children's day-care centers are available world-wide, and provide parents and families with a wide variety of services including social and health care as well as early education for their pre-school children (Watson et al, 2014). With the large increase of working mothers within the labour force, the demand for child-care in the form of day-care centers for pre-school children has also increased substantially over the past few years (Chen, 2013). Within most industrialized countries, infants, under the age of 1 and toddlers between the ages of 1 and 3 years, as well as pre-school children of ages 3 to 6 years attend out of home care, usually in the form of day-care centers (Kotch et al, 1997). Three-fourth of children within the United States attends day-care centers (Copeland, Sherman, Kendeigh, Kalwarf & Saelens, 2012).

With this additional increase in the use of day-care centers, child safety is becoming an increasingly bigger concern for parents (Chen, 2013). Moving from a parental and home-environment care setting, can have significant effects on a child's well-being as they become dependent on day care staff and caregivers for their safety (Chen, 2013). Young children cannot understand the risk of injury and therefore do not know how to stay safe, thus an appropriate child-care setting together with educated and qualified staff providing supervision for children is essential (Waibel & Misra, 2003). Ensuring the presence of well-trained, qualified staff is of utmost importance in order to find a balance between implementing any measures in extremes; whereby either injury prevention procedures are followed loosely or followed to an extent that it hinders physical activity and development of children (Copeland, Sherman, Kendeigh, Kalwarf & Saelens, 2012). One of the major concerns that have occurred in regards to safety amongst pre-school children is that day-care centers are not always the safer option (Kojpar & Wickizer, 1996), however, to determine exact underlying causes of injuries in day-cares is proving to be a difficult, but an on-going task (Kojpar & Wickizer, 1996).

Caregivers working in day-care centers are assigned with the daily task of ensuring they keep children safe and free of injuries (Waibel & Misra, 2003). Caregivers have several important tasks at hand and must be educated on prioritizing duties. Albeit their jobs are challenging, they must learn to provide a safe environment for children, prevent injuries while following regulations (Waibel & Misra, 2003). They therefore play a very important role in day-care center injuries. Research has shown that caregivers need to be given continued

education to prevent injuries amongst children (Kojpar & Wickizer, 1996). In order to increase safety and reduce injuries, caregivers need to understand and learn not only a child's temperament and behavior but also the cultural and physical environment of a good child-care setting (Davis, Godfrey & Rankin, 2013)

Although injuries do occur, it should be an understood fact that injuries involving children under supervision are predictable and avoidable (Eberl et al, 2009). Increased levels of safety should be imposed to ensure a safe environment for children attending day-cares and addressing and reducing the number of injuries in day-care centers should be any country's health care priority (Eberl et al, 2009)

1.2 Problem Statement

Research has shown that injuries amongst children in child-care settings are increasing significantly with time (Canadian Pediatric Society-CPS, 2009). This issue is becoming a growing concern due to the suffering it causes amongst children, increase in rates of morbidity and mortality as well as loss of productivity amongst parents/guardians.

Currently, very few studies evaluating safety practices in Malaysian day care centres have been studied. Although a checklist (Quality improvement and accreditation system – QIAS) has been designed for day-care centres to help evaluate of safety standards and well-being of children, many centres are often reluctant to asses themselves, thus making the implementation of this checklist not as effective as it should be (Chiam, 2008).

With the increase numbers of working mothers and the heightened cost of in-house maids, the demand for safe and reliable day-care centres is of utmost importance. Children become dependent upon good supervision of caregivers. Additionally, in Malaysia, injuries and accidents occurring in day-care centres are given little importance, with no data recorded to date. Only very serious injuries involving mortalities amongst children were being broadcasted in mass media and social media. Therefore, it is paramount to re-assess the standard of care provided in day-care centres in order to identify gaps in their policies and practices. Ultimately, safety and health of children in day-care centres will be maintained and improved from time to time.

1.3 Objectives

1.3.1 General Objective

To determine factors that influence safety practice for injury prevention in day-care centres in Selangor and Putrajaya.

1.3.2 Specific Objectives

- i. To measure safety practices for injury control in day-care centers using a safety checklist
- ii. To determine the day-care characteristics (number of children enrolled, caregiver to child ratio, fees per child and availability of current licence)
- iii. To determine the children characteristics (age, gender, ethnicity) in day-care centre.

- iv. To determine caregiver socio-demographic (gender, age, ethnicity, religion, marital status, number of children, level of education)
- v. To determine the job factors of the caregivers (Job status, income, years of experience, level of mandatory or optional training whether completed or provided)
- vi. To identify the safety knowledge amongst caregivers in terms of infant safety, toddler safety and first-aid knowledge.
- vii. To determine the association between caregivers' socio-demographic factors, job factors of caregivers, children characteristics, day-care characteristics and safety knowledge amongst caregivers with safety practice for injury prevention in day-care centres
- viii. To determine the predictors of safety practices for injury prevention in day-care centres.

1.4 Significance of Study

By understanding and identifying the factors that affecting safety practices in day centres, we can have a better understanding of the issues and work out strategies effectively to prevent future injuries and eliminate risks that lead to injuries. Additionally, by providing a safer environment, the child, parent and caregiver can benefit by avoiding unnecessary burden and stress. Knowledge from this study can help obtain information and data to help guide and educate the Malaysian community on how build and maintain safe day-care centres.

1.5 Hypotheses

It is hypothesized that there is an association between socio-demographic factors of caregivers , day-care characteristics, children characteristics, job factors of caregivers and safety knowledge amongst caregivers with safety practices for injury control in day-care centres.

1.6 Variables

1.6.1 Dependent Variable

- i. Safety practice for injury prevention in day-care centres. It can be categorized into safe and not safe.

1.6.2 Independent Variables

- i. Day-care center characteristics: number of children, caregiver to children ratio, fee per child (costliness), license renewal/maintenance
- ii. Socio-demographic factor variables: Gender, age, ethnicity, religion, marital status, number of children, level of education
- iii. Job Factors of caregivers: Job status, income, years of experience, level of training completed/provided
- iv. Safety knowledge of caregivers
- v. Children characteristics (Age, gender, ethnicity)

2.0 Literature Review

2.1 Childhood Injuries

The leading preventable cause of death amongst children is injuries (Hammig & Weatherly, 2003). In general, injuries amongst children have a very vast range of possible causes. The causes for different types of injuries can be subdivided into intentional and unintentional injuries. Intentional injuries include but are not limited to child abuse/neglect, homicide and suicide (Hammig & Weatherly, 2003). Unintentional injuries have a bigger range of causes, and can include; drowning, suffocation, falls, cuts and piercings, firearms, fire, poisoning, road traffic accidents, amongst others (Hammig & Weatherly, 2003). Additionally, it has also been stated that occurrences with no visible damage are often not categorized as injuries at all (Kotch et al, 1997). These may include incidences such as choking on food or swallowing coins (Kotch et al, 1997). Bartlett (2002) stated that children are also more susceptible to injury due to both their size and physical immaturity. Injuries in younger children are more likely to result in growth plate fractures due to open epiphyses of bone; this could lead to possible disfigurement. Thin epidermal layer increases severity to burn, smaller airways increase risks of choking and aspirations, a larger head to body ration increases the risk of head injuries or an immature nervous system makes children more susceptible to absorbing toxins.

This number of reported cases, prevalence and mortality due to childhood injuries has also caused an increase in the economic burden. Aside from being a major cause of death, injuries in children cause disabilities and suffering for many young, pre-school children and in turn, their families (Watson et al, 2014). Many children who suffer due to injuries are subjected to the burden of severe suffering, long-term ailments, disabilities and lifetime follow-ups of medical care (Bartlett, 2009). Many children also face psychological stress, hindering their overall daily and routinely activities. This leads to increased health care costs, loss of wages by parents and restriction of activities amongst children, thereby causing a loss of productivity. Additionally, parents and guardians suffer psychological stress and financial stress due to increased health care costs (Kojpar & Wickizer, 1996). Parents and guardians often need to take time off from work to provide care for their children, thus leading to loss of wages and an overall loss of productivity (Kopjar and Wickizer, 1996).

2.2 Causes of Injuries

Garzon (2005) explains the significance of agent factors of injury. He explained that agents are the source through which injuries can occur. These sources include environmental, physical and thermal forces, the action of which leads to any specific type of injury resulting in bodily harm (Garzon, 2005). These agent factors include but are not limited to sharp edges (toys/furniture/objects), heat, effect of gravity during falls, amongst others. Garzon (2005) further explains that if we modify product designs we can effectively modify these agent factors thereby preventing further and future injuries.

Within USA alone, 200 000 people make emergency room visits because of injuries due to playground equipment (Tinsworth & McDonald, 2001). According to the Consumer Product Safety Commission (CPSC), serious injuries and deaths occurred due to falls, hanging, and impact with surface, sharp edges, protrusions and entrapment. Multiple studies have been carried out to explore injuries amongst children using playground equipment. A

majority of studies indicate that the height of playground equipment and shock absorbing undersurface beneath the equipment have an impact on injuries occurring in playgrounds (Khambalia et al, 2006). Research by Alkon (1999) showed that the most common area for injury occurrence amongst children was the playground (74%) with injuries occurring during free-play (81%). Falls comprise of one of the leading factors that lead to injuries amongst children. Although short falls do not necessarily cause severe injuries in children, they are considered a risk factor for injury (Khambalia et al, 2006). Research carried out by Alkon (1999) indicated that 40% of all injuries that occur in day-care centers occurred due to falls. Although times have advanced since, Runyan (1991) found that many centers do not pay attention to maximum playground equipment heights or any form of surfacing.

According to Garzon (2005), indoor agent factors can include numerous physical environmental factors such as unguarded staircases, poorly lit hallways, crowding, and absence of working fire equipment. Non-physical factors include supervisory practice and skills (Garzon, 2005). Supervisory practice skills are of utmost importance amongst preschoolers as these young children have an arousing curiosity to explore their physical environment including hazardous areas. They are a great risk of injury and must be closely supervised to eliminate potential hazards (Garzon, 2005). The ingestion of cough/cold medications, cleaning substances, personal-care products and other chemical often leads to poisoning amongst children, and therefore these items should be stored carefully out of children's reach (Garzon, 2005)

2.3 Prevalence of injuries

Results of one survey revealed that 56% of child injuries occurred due to child factors whereas only 1.5% occurred due to environmental factor and 42.9% of injuries were due to a combination of both child and environmental factors (CPS, 2009). In Canada, it was reported by the Hospitals Injury Reporting and Prevention Program database that out of 112,000 records, 1008 injuries occurred to children less than five years of age in day-care settings, with more bruises and abrasions as compared to non-day care setting children (CPS, 2009). It was also reported that majority of the day-care injuries occurred due to child factors (CPS, 2009). Similar patterns of injuries were found amongst children in 7 day-care centers in USA as reported by Briss, Sacks, Kresnow, & O'Neil (1994).

Kojpar & Wickizer, (1996) also found that within day-care settings, 65% of injuries were due to falls, and 16% due to collisions. Likewise, in another study conducted by Kotch et al, (1997), it was found that 51% of injuries occurred due to falls, 32% due to sharp objects and 8% due to bites. Therefore, it is suggested that supervision provided by caregivers is a significant factor to prevent injuries in day-cares (Davis, Godfrey & Rankin, 2013). Miller, Romano and Spicer (2000) reported that in 1996, unintentional injuries prevailed mostly in the form of brain and spinal cord injuries, burns and limb injuries; leaving approximately 150 000 children and adolescents permanently disabled and required lifetime follow-up care.

2.4 Injury Prevention

Injuries amongst children is a well-published and well-talked about topic, that all caregivers and parents should understand without having to speak off, as well as having a positive attitude toward it (Watson et al, 2014). However, despite this, many caregivers lack sufficient knowledge in injury prevention and this has become an increasingly neglected topic

within day-care centers (Watson et al, 2014). In many day-care centers even though safety audits and prevention are present in every day-care facility, their implementation may not be thoroughly followed. Results from a research carried out by (Watson et al, 2014) revealed that 95% of caregivers agree that injuries amongst children are in fact preventable. However this is only possible if day-care centers work together and coordinate in injury prevention activities within their local areas (Watson et al, 2014). Although it may be a difficult task, legislative and community-based efforts have proven to decrease injuries amongst children in the past (Davis, Godfrey & Rankin, 2013). Children who experience more severe injuries leading to blood or bodily fluid exposure thus become prone to further infections, leading to more complicated health issues (Waibel & Misra, 2003).

Identifying injury risks is one of the most important aspects of preventing injuries. Whitehead and Owens (2012) identified a difference in parents' perceptions of childhood accidents that could occur. It was found most parents understood that injuries were avoidable but many times they were inevitable due to the nature of children; being clumsy and overactive kids' (Whitehead and Owens, 2012). The first step in injury prevention begins with the staff. Caregivers must be motivated to learn in order to prevent injuries amongst young children (Raymond, Lie & Berkseth, 1993). They must not only be educated on the potential hazards in their environment, risk of injury, and strategies of injury prevention, but they must also study and understand the population with which they work, and should be able to distinguish between the different types of injuries different children are susceptible to (Raymond, Lie & Berkseth, 1993). Injury logs and records should be maintained and enforced and these incidences should be discussed with the management and health team on a periodical basis (Raymond, Lie & Berkseth, 1993).

One article suggests that safety checklists should be distributed to caregivers to be filled out on a weekly, monthly, seasonal and yearly basis within child care centres (CPS, 2009). Watson et al (2014) however states that often, implementing strategies to prevent injuries can be a difficult task. Caregivers must be trained on documenting injuries (Watson et al, 2014) and should receive in-service education as to what, when and how to document cases (Raymond, Lie & Berkseth, 1993). Furthermore, very little attention is given to the roles of day-care centres in preventing injuries, and a bigger focus is made on their evolution and impact (Watson et al, 2014). A number of variables affect the incidence rate of injuries, inclusive of but not limited to, age, time of the day as well as the season of the year (Waibel & Misra, 2003). In fact Kotch et al, (1997) states that caregivers in child care settings should not only be trained in safety but should also have knowledge of peak times of injuries.

2.5 Conceptual Framework

Several factors come into effect when trying to maintain a safe environment in any day-care center. The factors that will be studied in this research are identified within the Conceptual Framework model. This framework includes the characteristics of day-care centers based on the number of children attending, caregiver to children ratio and the fee per child and license renewal. Socio-demographic factors of the caregivers as well as job factors are also taken into consideration, as well children characteristics. Refer to Figure 1.

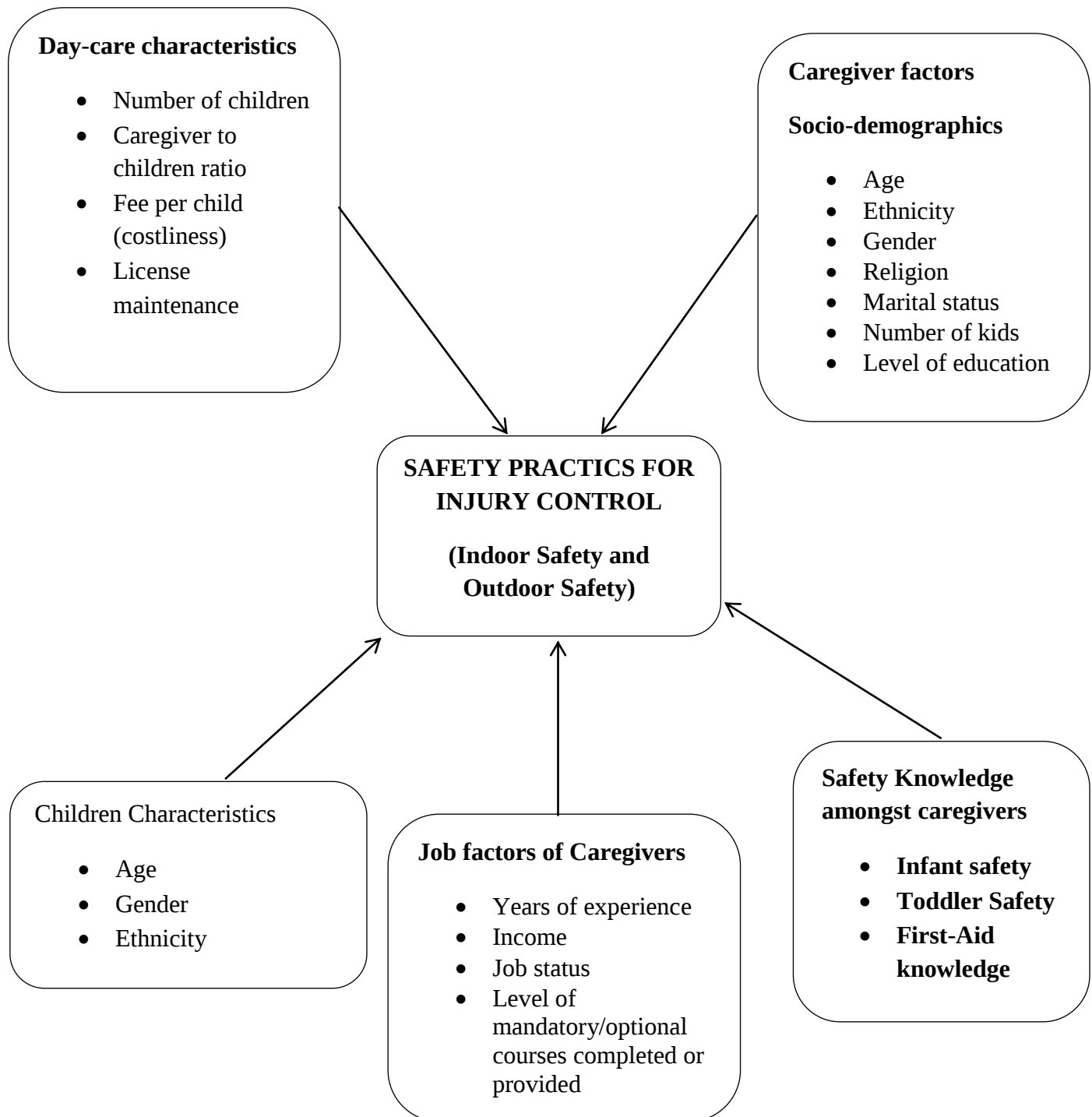


Figure 1: Conceptual Framework

3.0 Methodology

3.1 Research Design and Sampling Technique

3.1.1 Study Location: Licensed Day-Care centres in Selangor and Putra Jaya, Malaysia

3.1.2 Study Design: A cross-sectional study design.

3.1.3 Study duration: 2 years

3.1.4 Sampling:

- i. **Study population:** Caregivers and children working in registered day-care centres in Selangor and Putrajaya, Malaysia.
- ii. **Sampling Unit:** A caregiver – working in a given registered day-care centre in Selangor and Putrajaya, Malaysia.
- iii. **Sampling frame:** List of registered day-care centres in Selangor and Putrajaya obtained from the Association of Registered Childcare Providers Malaysia.
- iv. **Sampling method:** List of registered day-care centres in the Selangor area will be divided into clusters and random sampling using a random number table will be used to select caregivers.

3.1.5 Sample size: 1178 participants. Calculation of sample size for comparing two proportions was done using Lameshow et al (Lwanga & Lameshow, 1991). The prevalence was based on the study by Browning, Runyan and Kotch (1996). Based on all the variables accounted for, the larger minimum sample was taken as the sample size for this study

Based on 80% power, Type I error of .05, design effect of 2 a sample size of 1178 participants was calculated

Sample size calculation using proportion for a cross-sectional two-proportion study design

$$n = \frac{Z^2_{1-\alpha/2} [P_1(1-P_1) + P_2(1-P_2)]}{d^2}$$

Z = Z statistic for a level of confidence (95% confidence at a conventional, Z = 1.96)

P = expected prevalence or proportion

d = precision (in proportion at 5%, d = 0.05).

Therefore:

$$n = \frac{1.96^2 [(.80)(.20) + (.20)(.80)]}{.05^2}$$

$$n = \frac{(3.84)(0.32)}{0.0025}$$

$$n = \frac{1.2288}{0.0025}$$

$$n = 491$$

2 group design effect = x2 therefore

$$491 \times 2 = 982$$

20% attrition rate

$$982 \times 0.20 = 196.4$$

Adjusted sample size

$$982 + 196.4 = 1178.4$$

$$n = 1178.4 \approx \mathbf{1178}$$

3.2 Data

3.2.1 Data Collection

The main measure of instrument will be standardized questionnaires and safety checklist. The questionnaires and safety checklist will be self-designed/constructed and will consist of close ended questions. Once the participating daycares have been chosen, consent needs to be obtained from each employee (caregiver) participating in the research.

Questionnaires will be provided in Malay or English as per the preference of the participant.

The complete survey will consist of 3 sections with sub-sections

Section I – will consist of 3 sub-sections

- i. socio-demographics of the caregiver filling out the questionnaire
- ii. job factors of said caregiver
- iii. questionnaire assessing safety knowledge of the caregiver

Section II –will consist of 2 subsections

- iv. day-care characteristics; caregiver to children ratio, number of children attending and fee per child, license renewal
- v. children characteristics

Section III will consist of a safety checklist to be filled out by researcher

3.2.2 Inclusion and Exclusion Criteria:

i. Inclusion Criteria:

- i. Day care centres registered and licensed under Malaysian Social Welfare Department as per the Child Care Centre Act 308.
- ii. Day-care centres in the Selangor and Putra Jaya regions
- iii. Full-time and part-time caregivers attending to children in day-care centres having worked in the day-care for a period of 1 month or more
- iv. Caregivers dealing with the children directly on a daily basis

ii. Exclusion Criteria:

- vi. Caregivers and parents who do not give consent to conduct the study

3.2.3 Ethical Clearance

All methods and sample collection procedures are to be reviewed by the ethical committee of the University

3.5 Statistical Analysis

The Statistical Package for Social Sciences Software (IBM SPSS; version 21.) will be used to analyze the data by Descriptive and inferential analysis. Statistical significance will be set at $P < .05$.

Frequency distributions will be used to analyze the socio-demographics of caregivers as well as number of children per day care, caregiver to children ratio and median fee per child per day-care.

Inferential statistics which include chi-square tests, independent t-test and logistic regressions will be computed in this analysis.

4.0 Expected Outcome and Discussion

The prevalence of childhood injuries in day-care centres is a growing concern in Malaysia. The purpose of this study is to identify the factors that influence safety practice for injury prevention amongst caregivers in licensed day-care centers. It is predicted that safety practice amongst caregivers in day-care centres are associated with several factors which include socio-demographic factors, job factors, safety knowledge as well as the day-care characteristics and children characteristics. The level of training provided to caregivers is also an indication to the extent to which safety and health regulations are enforced and implemented within these day-care centers. Results from this study can be used to increase awareness of the need of standardized safety procedures to prevent of injuries amongst children in day-care centres, and areas that need improvement and further practice to control, prevent and eliminate risk of future injuries amongst children in day-care centers.

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Declaration

No conflict of interest is declared.

Authors' contribution

Author 1: Literature Review, preparing Research Proposal and executing the research activities

Author 2: Contributing in methodological aspects, planning the research activities and analysis aspect of this research

Author 3: Contributing in methodological aspects of the research.

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