

APPLICABILITY OF MALAYSIAN STANDARDS (MS 966) IN BENEFITING HEALTH AND SAFETY OF CHILDREN IN MALAYSIA

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ABSTRACT

Child injuries caused by unsafe climbing equipments has become a public concern. The Malaysian Standards for playground equipment (MS 966: 2001 and MS 966: 2017) was developed and reviewed periodically by the authority of the Consumer Products, Personal Safety and Services Industry Standards Committee, Department of Standards Malaysia (DSM) and SIRIM Berhad, as a means of protecting and benefiting the health and safety of children. This paper aims to examine and critique the applicability of Malaysian Standards on standardizing design specification and safety performance of climbing equipments. The review process focuses on information gaps within the Malaysian Standards in terms of feasibility, where discussions on analytical issues in Malaysian Standards of climbing equipment was presented and recommendations on improvement were proposed. The result showed the standards focused mostly on swings and slides, whilst three analytical issues found that important design and safety standards in climbing equipments were unclear; which included free fall height, maximum height and designated age group. These three analytical issues have to be revised in order to achieve sustainable design in climbing equipment. Results from this paper could assist in revising the current standards incorporated with advanced urban recreation safety for injury control.

Keywords: : Playground, Outdoor injury, Public health, Urban recreation safety, Recreation equipment

1. INTRODUCTION

Recently, children in Malaysia suffer from playground injuries caused by unsafe climbing equipments. It has become a public concern and topical issue where current design standards must be looked into. Public Complaints Bureau Director-General, Harjeet Singh said between 2015 and 2016, local authorities had received 11,231 complaints regarding playground injuries, while based on the injury statistics from the Ministry of Health (MOH), 530 injuries caused by falls cases were reported in public hospitals involving playground equipment between 2014 to 2016 (Jolyn N., 2018). According to Zain in 2012, 75% of playground injuries were caused specifically due to falls, and climbing equipment was accounted for causing the most injury among children. Meanwhile, through the years it was still publicly known to be one of the most popular equipment among children (Bourke & Sargisson, 2014; Mani et al., 2012; Mc Donald, 2001; Sargisson & Mc Lean, 2013).

As reported by Oh in 2014, according to a Certified Playground Safety Inspector (CPSI), Noriah Mat, although most local playgrounds do not comply with the safety and maintenance standards, they were generally MS 966: 2001 (Playground Equipment) compliant. Noriah Mat claimed that Malaysian Standards on playgrounds were not stringent and has not changed much over the past 20 years. Noriah Mat, (Sara J. M., 2016) reiterated further the need for a comprehensive nationwide study of playgrounds in Malaysia and reaffirmation of Malaysian safety standards. High fall injuries cases of children in playgrounds' were mostly caused by unsafe climbing equipments also actuated DSM to review the existing scope and requirement of MS 966: 2001 and MS 966: 2017 (Playground Equipment) Improvised

design guideline could help to promote greater and better safety awareness among those related parties including manufacturers, parks and recreational personnel in producing safer climbing equipment (Saral J. M., 2016).

Moreover, a recent study showed 90% of parents were dissatisfied with the safety level of existing climbing equipment (Ling, C.K., Azmeer, R. A., Dolah, M.S., Hasley, S., & Bolong, J., 2018). Although there was no direct injury data from MOH with regard to unsafe playground equipment, however, general data on children injuries based on per visit reported to MOH was obtained. Data showed that children nowadays always suffered from injuries involving the head (4,227 visits), followed by injuries to the elbow and forearm (2,833 visits) and injuries to the shoulder and upper arm (2,138 visits)(Refer Table 1). Results from this data were close-related to children injuries which occurred in playgrounds; therefore, design standards of climbing equipment shall be revised by focusing on reducing the top three types of children injuries.

Table 1: Top 3 diagnosis based on number of visit in MOH hospital caused by injury among children between 3 to 12 years old, Malaysia, 2015

	Description	Code ICD-10	Number of visit
1.	Injuries to the head	S00-S09	4,227
2.	Injuries to the elbow and forearm	S50-S59	2,833
3.	Injuries to the shoulder and upper arm	S40-S49	2,138

*Source: Patient Database from MOH hospitals, 2015 (updated in Julai 2016)
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Nevertheless, according to Sarah in 2016, a research and policy manager from the Malaysian Association of Standards Users also encouraged collaboration and contribution from all related parties to help in providing critical reviews to construct the revision and implementation of the MS 966: 2001 and MS 966: 2017 for it to become a success.

Based on these data, it has verified the need for a critical review on Malaysian Standards regarding climbing equipments. Malaysian Standards was developed by the technical committee on playground equipment under the authority of the Consumer Products, Personal Safety and Services Industry Standards Committee. The result of the study could provide major information for technical committees on playground equipment, and also for the Department of Standards Malaysia and SIRIM Berhad that periodically

reviews the Malaysian Standard (MS 966), which was significant for allowing Malaysian children to play with safe and trustworthy climbing equipment.

2. METHOD

This study aims to examine and critique the applicability of Malaysian Standards on standardizing design specification and safety performance of climbing equipment. The applicability of Malaysian Standards on climbing equipment plays a crucial roles in protecting our children and it revolves around topical events of urban recreation safety. Three Malaysian Standards developed below by the technical committee on playground equipment under the authority of the Consumer Products, Personal Safety and Services Industry Standards Committee was reviewed:

- i. MS 966: Part 1: 2001 (Playground Equipment: Part 1: Specifications for Materials (first revision)
- ii. MS 966: Part 2: 2001 (Playground Equipment: Part 2: General Safety Requirements (first revision)
- iii. MS 966: 2017 (Playground Equipment – Safety Performance for Public Use – Specification (second revision)

Since this paper aims to discuss the applicability of Malaysian Standards on climbing equipment, the review will look further on information gaps and data collected which were criticized in terms of feasibility. Discussions on analytical issues within the Malaysian Standards of climbing equipment were presented and recommendations for improvements were proposed.

3. CRITIQUE, DISCUSSION AND RECOMMENDATION

3.1 First analytical issue: Designated Age Group

According to the current standard, to ensure the general safety of users, the dimensions and degree of difficulty of the climbing equipment should be suitable for the intended users or age group. Designers should take note that equipments are designed so that the risk involved in play is apparent, obvious and foreseeable by the children. However, it was not really reliable to assume all children are mature enough to ponder over which equipment was designed for their age group. They will probably consider all pieces of equipment installed in a playground were designed and safe for them to use. It was proposed for a partition to be located in two different areas targeted for the intended age group – (5 to 12 year old) and (all ages of users).

<p>4. Safety requirements</p> <p>4.1 General</p> <p>The dimensions and degree of difficulty of the equipment should be suitable for the intended users or age group. The equipment should be designed so that the risk involved in play is apparent and foreseeable by the child.</p> <p>NOTE. For additional safety of equipment accessible to children under 36 months, specific requirements have been included for the following areas:</p> <ul style="list-style-type: none"> - head entrapment (4.7.2 and MS 966 : Part 3); - protection against falling: - guardrails (4.4.3); - barriers (4.4.4); - stairs (4.9.2); - ramps (4.9.3).
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Figure 1: Source: MS 966: Part 2: 2001 (Playground Equipment: Part 2: General Safety Requirements (first revision), pg 6.

3.2 Second analytical issue: Free fall height

Free fall height was always meant to be the main cause of child injuries (Zain, 2012) since it involved taking into account the possible movements of the equipment and its user. In general, the appropriate free fall height distance must be considered to lessen the risk of injury.

Table 2: Free fall height for different types of use according to MS 966: 2001

Type of use	Vertical distance from the surface of
Standing	Foot support to surface below
Sitting	Seat to surface below
Hanging	Hand support/foot support to surface below

Source: MS 966: Part 2: 2001 (Playground Equipment: Part 2: General Safety Requirements (first revision), pg 13.

According to standards in MS 966: Part 2: 2001, free fall height depended on different types of equipments, yet shall not exceed 3m. However, the term “depended on different types of equipments” in the standards caused confusion in setting the appropriate free fall height for climbing equipments. Subsequently, as for climbing equipments, free fall height was meant to be the maximum distance from foot support to surface below, yet 3m of falling distance from the highest foot support is apparently too high for climbing equipments that involved higher risks during playtime. Consequently, the

existing climbing equipment might not be safe for usage even though they were in accordance with the standards. Further study needs to be done on investigating the appropriate free fall height, specifically for climbing equipment.

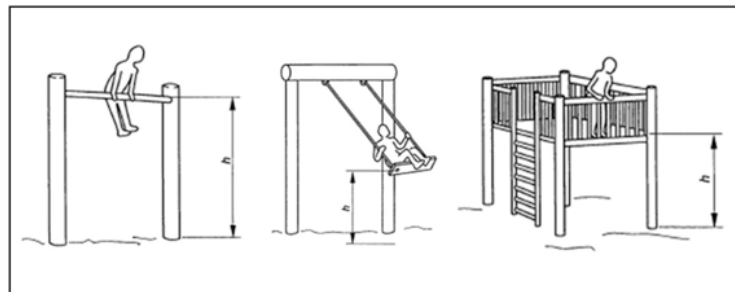


Figure 2: Example of free fall height
Source: MS 966: Part 2: 2001 (Playground Equipment: Part 2: General Safety Requirements (1st revision), pg 37.

3.3 Third analytical issue: Maximum height

Rigid free standing climbing equipments usually use rigid rungs as hand support to ascent and descent climbing equipments. Rungs must be between 24.1 mm to 39.4 mm in diameter and shall not twist or rotate about its own axis. The free fall height for these equipments shall be distanced between the highest part and the protective surface below the climbing equipments. However, there was no example enclosed in the standards. Besides that, the maximum height until the protective surface was not indicated in the standards; hence the maximum height should be set in the standard as a guide in producing safer climbing equipments. Formulating the maximum height for these climbing equipments in design standards was necessary. Even though every piece of climbing equipments had its own designated play surface, some children may try to go beyond the designated play surface and climb to the highest point.

4. CONCLUSIONS

The result from critiques on this paper revealed that both Malaysian Standards of playground equipment (MS 966: Part 2: 2001 and MS 966: 2017) are not applicable to playground climbing equipment developers. Three analytical issues found that important design and safety standards in climbing equipment were unclear; which include free fall height, maximum height and designated age group. Malaysian parents seemed to have lost their

confidence with climbing equipments (Ling, C.K. et al., 2018) due to the high injury rate involving children. Thus, immediate action must be taken for clarity regarding climbing equipments (Zain, 2012) that abided Malaysian Standards, immediate action has to be taken. In a nutshell, this paper also shows significance and national findings on a topical event revolved around urban recreation involving children's safety in playgrounds.

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