

**EVALUATION OF KNOWLEDGE, ATTITUDE
AND BELIEFS REGARDING MEDICINES
AMONG PRIMARY SCHOOLCHILDREN**

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**EVALUATION OF KNOWLEDGE, ATTITUDE
AND BELIEFS REGARDING MEDICINES
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by

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DEDICATION

I dedicate this work to my parents (Thanoon Dawood and Huthaima Younis), my brothers (Anmar and Eethar) and my sister (Israa). Their endless support of love, encouragement and prayers made me to work hard to attain my goals.

Thank you for the love and sacrifices

Omar

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LIST OF ABBREVIATIONS

FIP	International Pharmaceutical Federation
KAB	Knowledge, Attitude and Beliefs
OTC	Over-The-Counter medicine
SES	Socio-economic status
USP	United States Pharmacopeia

**PENILAIAN PENGETAHUAN, SIKAP DAN KEPERCAYAAN
BERKAITAN UBAT-UBATAN DALAM KALANGAN
KANAK-KANAK SEKOLAH RENDAH**

ABSTRAK

Penggunaan ubat untuk rawatan masalah kesihatan adalah amalan biasa dalam kalangan kanak-kanak. Kebanyakan kanak-kanak membentuk sikap dan kepercayaan serta menaruh harapan terhadap ubat-ubatan melalui pengalaman yang lampau berkaitan ubat-ubatan melalui ibu bapa atau dengan memerhati ahli keluarga mengambil ubat-ubatan. Terlalu sedikit kajian yang telah dijalankan berkenaan pengetahuan ubat-ubatan dalam kalangan kanak-kanak Malaysia. Kajian ini bertujuan untuk menilai pengetahuan, sikap dan kepercayaan (KAB) berkaitan ubat-ubatan dalam kalangan kanak-kanak sekolah rendah dan mengenalpasti faktor-faktor yang boleh dikaitkan dengan pengetahuan, sikap dan kepercayaan mereka. Kajian keratan lintang telah dijalankan dalam kalangan kanak-kanak sekolah darjah 5 dan 6 di empat buah sekolah rendah di kawasan pulau dalam negeri Pulau Pinang. Kaedah persampelan jenis mudah dan bertujuan telah digunakan untuk memilih sekolah dan kanak-kanak. Data dan maklumat telah dikumpulkan melalui borang soal selidik diisi sendiri yang telah diedarkan kepada semua kanak-kanak sekolah dan ibu bapa yang terpilih. Soal selidik mengandungi satu senarai item-item berkaitan pengetahuan, sikap dan kepercayaan yang telah dibangunkan berdasarkan item yang diformulasi dan diambil daripada soal selidik-soal selidik yang diterbitkan dalam jurnal saintifik. Semua kanak-kanak dari darjah 5 dan 6 dalam empat buah sekolah rendah yang

terpilih dan ibu bapa mereka telah dimasukkan ke dalam kajian ini. Saiz sampel keseluruhan bagi kanak-kanak darjah 5 dan 6 adalah 1000. Daripada 2000 soal selidik yang telah diedarkan iaitu 1000 kepada kanak-kanak dan 1000 kepada ibu bapa kepada kanak-kanak yang terpilih, 842 soal selidik daripada kanak-kanak dan 842 daripada ibu bapa telah dilengkapkan dengan sempurna dan dikembalikan (kadar respons = 84.2%). Dapatan kajian ini menunjukkan nilai skor min \pm sd KAB daripada 31 poin adalah 18.65 ± 6.02 bagi kanak-kanak berumur 11 tahun dan 20.30 ± 5.12 bagi 12 tahun. Umur kanak-kanak mempunyai impak yang signifikan ke atas pengetahuan, sikap dan kepercayaan mereka terhadap ubat-ubatan. Tambahan lagi, terdapat perbezaan KAB yang signifikan dalam kalangan kanak-kanak dari segi umur dan status kesihatan ($p < 0.05$). Kanak-kanak yang lebih tua atau yang mempunyai penyakit kronik adalah lebih berpengetahuan tentang ubat-ubatan. Latar belakang etnik kanak-kanak mempunyai kesan ke atas skor KAB; kanak-kanak berbangsa Melayu dan Cina lebih berpengetahuan tentang ubat-ubatan berbanding India. Ciri-ciri ibu bapa juga didapati mempunyai pengaruh ke atas skor keseluruhan KAB kanak-kanak.. Tahap pendidikan dan jenis pekerjaan ibu bapa mempunyai impak yang signifikan ke atas pengetahuan, sikap dan kepercayaan kanak-kanak. Kanak-kanak yang mempunyai ibu bapa dengan tahap pendidikan yang lebih tinggi adalah lebih berpengetahuan tentang ubat-ubatan. Tambahan lagi, kanak-kanak yang mempunyai sekurang-kurangnya seorang daripada ibu bapa mereka sebagai ahli profesional kesihatan mempunyai pengetahuan yang lebih baik tentang ubat-ubatan. Nilai p menunjukkan terdapat perbezaan skor KAB yang signifikan dari segi status sosioekonomi mereka ($p < 0.05$). Kanak-kanak dengan tahap sosioekonomi yang lebih

tinggi mempunyai skor KAB yang lebih tinggi. Sebagai kesimpulan, kajian ini telah mengenalpasti bahawa kanak-kanak mempunyai pengetahuan yang terhad tentang ubat-ubatan, sikap yang negatif terhadap beberapa aspek penggunaan ubat-ubatan dan kepercayaan yang negatif tentang efikasi ubat-ubatan. Terdapat banyak faktor yang didapati boleh mempengaruhi pengetahuan mereka tentang ubat-ubatan yang patut diambil perhatian oleh berbagai pihak. Pendidikan kesihatan di peringkat sekolah diperlukan terutamanya berkaitan topik ubat-ubatan dan penggunaannya secara rasional.

EVALUATION OF KNOWLEDGE, ATTITUDE AND BELIEFS REGARDING MEDICINES AMONG PRIMARY SCHOOLCHILDREN

ABSTRACT

The use of medicine for the treatment of health problems is a common practice among children. Most children are forming attitudes, beliefs and expectations about medicines through their past experience with medicines, through the parents or by observing family members taking medicines. Very few studies have been conducted about medicine knowledge among Malaysian children. This study aimed to evaluate knowledge, attitudes and beliefs about medicines among primary schoolchildren and identify those factors that may associate with their knowledge, attitudes and beliefs. A cross-sectional survey was conducted among schoolchildren from grades 5 and 6 in four primary schools in Penang Island. A convenience and purposive sampling methods were used to collect the data through a self-administered questionnaire to all schoolchildren and their parents. The questionnaire consisted of a list of knowledge, attitude and beliefs items, which were developed based on item formulation and taken from published questionnaires in scientific literature. All schoolchildren from grades 5 and 6 in four primary schools and their parents were included in the survey. The total sample size of fifth and sixth graders was 1000 participants. Out of 2000 questionnaires distributed, 842 questionnaires from children and 842 questionnaires from the parents were successfully completed and returned (response rate = 84.2%). The findings of this study indicated that the Mean \pm SD score of KAB out of 31 points was 18.65 \pm 6.02 for 11 years old and 20.30 \pm 5.12 for 12 years old. The age of children

had significant impact on their knowledge, attitude and beliefs towards medicines. Furthermore, there was a significant difference in KAB among children related to their age and health status ($p < 0.05$). Older children or children who have chronic disease were more knowledgeable about medicines. The ethnic background of the respondents has an effect on their KAB score; Malay and Chinese children were more knowledgeable about medicines compared to Indian. The parents' characteristics were also found to influence the total KAB score of children. The parents' education level and parents' job had a significant impact on their children's knowledge, attitudes and beliefs. Children who have parents with higher education level were more knowledgeable about medicines. Moreover, children who have at least one of their parents as a health care professional have better understanding about medicines. In addition, the p-value indicated that there was a significant difference in KAB score according to their socio-economic status ($p < 0.05$). Children with higher SES have higher score of KAB. In conclusion, this study identified that children have limited knowledge about medicines, negative attitude to some aspects of using medicines and negative beliefs about the efficacy of medicines. There were many factors which influenced their knowledge about medicines which should be of concern. The school-based health education is needed especially on the topic of medicine and its rational use.

CHAPTER ONE

GENERAL INTRODUCTION

1.1 General Introduction

Among the common everyday life experience for children is using medicines for treatment of disease (Chambers *et al.*, 1997; Dengler & Roberts, 1996; Hansen *et al.*, 2003; Kogan *et al.*, 1994; Stoelben *et al.*, 2000). Most studies on medicine use have been done among adults, and very few are known about children's medicine-taking behaviour (Furu *et al.*, 2005; Holstein *et al.*, 2003; Huott & Storrow, 1997). In their everyday lives, children may get information about medicines through being given medicines, taking medicines themselves or from family members, friends, physicians and pharmacists, and through the media (Abahussain *et al.*, 2005; Chambers *et al.*, 1997; Stoelben *et al.*, 2000). All children are forming beliefs and expectations about medicines that may affect their behaviour for the coming years. However, very few studies have been conducted to investigate children's basic knowledge about medicines (Klaukka *et al.*, 1990; Kogan *et al.*, 1994; Rudolf *et al.*, 1993). The planning of the health education programmes is important especially the education about appropriate medicine use, as for other health behaviours, should begin in childhood (Nutbeam, 2000). This need is especially great for children in developing countries (Haak & Hardon, 1988; Price, 1989; Tomson & Sterky, 1986)

In Malaysia, the suggestion of medicine education should be adapted by taking local practices and the sources of information about medicines into account (Hameen-

Anttila & Bush, 2008); very few studies have been carried out on medicine taking behaviour among children. This study has been undertaken to identify the factors influencing medicine taking behaviour among children through their knowledge, attitude and beliefs regarding medicines.

1.2 Children and Medicines Use

Children understand the role of medicines in their everyday lives, especially when they are affected by minor illness like fever, colds and headaches. Minor illnesses in children are often cured at home with over the counter medicines (OTC). Even though there is wide use of medicines among children, they rarely receive medical advice about their medications from doctors or pharmacists (Dawood *et al.*, 2009). The limited role of physicians or pharmacists in educating children about medicines has been reported (Menacker *et al.*, 1999). Most health professionals, e.g., physicians, provide patient counselling concerning the medicines to the parents, but not to the child (Pantell, 1982; Perlman & Abramovitch, 1987). The noncompliance to medication is one of the common problems that addressed and recorded by physicians that since many pediatric patients do not follow their physicians' plan. However, this problem may lead to many implications in future concerning medicine use especially with children who have acute or chronic diseases (Dawood *et al.*, 2010). The International Pharmacy Federation (FIP) has documented the lack of communication between health care professionals and patients. The International Pharmacy Federation (FIP) adopted a statement of principle in 2001, "The pharmacist's responsibility and role in teaching children and adolescents about

medicines”. The statement says that the primary role of the pharmacist should be extended to children and adolescents in disseminating the information and counselling them about their medicines. The statement also urges the pharmacists to provide written material appropriate for children and for adolescents (International Pharmacy Federation, 2002). Children should take an active role in their recovery from illnesses because they are not passive recipients of the medication that is administered to them by parents or health care professionals (Bush *et al.*, 1982).

1.3 Medicine Education among Children

In spite of children being users of medicines, very little is known about their knowledge and awareness about medicines (Chambers *et al.*, 1997; Dengler & Roberts, 1996; Hansen *et al.*, 2003; Klaukka *et al.*, 1990; Kogan *et al.*, 1994; Rudolf *et al.*, 1993; Stoelben *et al.*, 2000). However, providing children with basic information about medicines are important to achieve rational use of medicines. Simple information about medicines is needed to support children in developing skills through improving their health literacy (Nutbeam, 2000).

Children spend most of their growing years in school. However, school health education programmes rarely include information about medicines. Even though efforts to educate children about health issues have increased, most school curricula do not include education about medicines. The Convention on the Rights of the Child in United Nations adopts the right of every child to self-determination, dignity, respect, non-interference and the right to make informed decisions. Informed

decision making related to the area of health implies that children should be informed about medicines (Fresle & Wolfheim, 1997).

The importance of medicine education was emphasised in the previous studies that medicine education is needed to avoid the risk behaviour in taking medicines among children, and in addition, to enabling them to make decisions in dealing with medicine in future (Haak & Hardon, 1988; Price, 1989; Tomson & Sterky, 1986). Early medicine education should start from the schools. Using materials in educating children about medicine is very important to attain the goals of medicine education (Hameen-Anttila *et al.*, 2004). Pictograms were found to be very helpful tool to communicate with children about their experiences with medicines. This suggests that pictograms could be used by health care professionals when communicating with children about their medicines (Hameen-Anttila *et al.*, 2004).

1.4 Statement of the Problem

In spite of reports of high rates of self-medication among children, there is a lack of medicine use guidelines (Chambers *et al.*, 1997). Many researchers have shown that children have a surprising level of autonomy when using medicines (Bush *et al.*, 1985; Chambers *et al.*, 1997; Rudolf *et al.*, 1993; Sloand & Vessey, 2001). Furthermore, previous studies reported that children have negative attitudes towards medicines and they have misunderstanding about the efficacy of medicines (Bush & Joshi, 2002; Gerrits *et al.*, 1996; Menacker *et al.*, 1999). Children believe that the action of medicines is related to their dosages, forms, colours, sizes or tastes, or that

expensive medicines work better than cheap ones (Bush *et al.*, 1985; Menacker *et al.*, 1999). In Malaysia, children are generally weak in all topics of health knowledge (Centre for Drug Research, 1988). Children are aware of the benefits of medicines for their treatment but they have inadequate knowledge to use medicines properly (Dawood *et al.*, 2009). The misuse of medicines has become a big problem not only in Malaysia but in most developing countries and this has caused considerable public and official concern (Centre for Drug Research, 1988). This situation is compounded by the fact that very few studies have been conducted related to medicine use among children in Malaysia.

1.5 Research Objectives

This study was conducted with the following objectives:

(i) General objectives:

1. To understand Malaysian children's knowledge, attitudes and beliefs regarding medicines; and
2. To identify the general sources of information about medicines that children have access to, and their familiarity with medicines.

(ii) Specific objectives:

1. To evaluate the differences of the external factors i.e. socioeconomic status of family, educational level of the parents and the parent's occupation with children's knowledge, attitudes and beliefs regarding medicines; and

2. To evaluate the knowledge, attitudes and beliefs regarding medicines among children related to their demographic characteristics e.g. age, gender, ethnicity, and health status.

1.6 Rationale of the Study

This study focused on the factors influencing medicine taking behaviour among children according to their knowledge, attitudes and beliefs. The irrational use of medicines, self-medication and medication non-compliance are problems related to medicines use especially among children and adolescents. Children do not have enough information to deal with medicines and most of them may influence by their past experience. This study is very important as it will demonstrate the need or otherwise of early medicine education in Malaysia which will provide the children with basic information to use medicines properly and to disseminate this information through children to their community. The lack of medicines knowledge makes children easily influenced by informal source of health information.

1.7 Significance of the Findings

Developing the knowledge and awareness about medicines use in childhood is very important for the future of children. The low awareness about medicines among children remains a social health concern. The research findings can provide useful information for health care professionals who communicate with children about the treatment of the most common health problems. Furthermore, describing children's knowledge, attitudes and beliefs about medicines will be benefited for health care

professional to disseminate basic information about medicines to children and the parents and to communicate directly with them about their medicines. However, determining the level of knowledge about medicines among children will contribute to the development of medicine education programme in Malaysia. This will be benefited for the Ministry of Education to develop medicine education curriculum according to the cognitive level of the schoolchildren. Therefore, medicine education will improve the comprehension of children about medicines use and educate them on some key behaviour to use medicines wisely before they become independent medicines users. This issue is very important for safety aspect for the future of the children. It is hoped that this study will improve the rational use of medicines among Malaysian children.

CHAPTER TWO
FACTORS INFLUENCING KNOWLEDGE, ATTITUDES AND BELIEFS
REGARDING MEDICINES AMONG CHILDREN

2.1 Introduction

The irrational use of medicines gets a lot of attention in developed countries but has more severe implications in developing ones. The health care systems are often incapable of performing adequately to meet the health needs of the population in developing countries. The pervasiveness of improper use of medicines has been documented in developing countries, some relating to the health care systems and some relating to cultural beliefs, traditions, and practices (Fraser, 1985; Greenhalg, 1987; Hardon, 1987; Michel, 1985; Tan & Tanchoco, 1988; Van der Geest, 1987).

The concepts of the children are a heterogeneous group explain that there is a difference in age, their experience and also their cognitive development. Children's knowledge may increase during childhood and adolescence when they get more information about the world (Stassen Berger, 1998). Experience strengthens their improvements in the processing information. According to the Piaget's classical knowledge theory of development, the ability of thinking consists of four development stages. The progression of each stage is the same; however, the rate of progression varies among individuals. Therefore, children's thinking differs from adults (Hameen-Anttila & Bush, 2008).

The stages of this theory are sensory motor stage (0-2 years), pre-operational stage (2-7 years), concrete operational stage (7-11 years), and formal operational (12 years through adulthood). At the first stage, the child knows the world through the interaction with the surrounding world, and cannot imagine any other persons who are not present. Therefore, learning about medicines cannot occur (Stassen Berger, 1998). At the second stage (pre-operational stage), the child focus is on the present and begins to remember past events. Thus, the child cannot understand the link between the cause and effect. Imaginative thinking is very typical at this developmental stage (Stassen Berger, 1998). At the concrete operational stage, cognitive thinking becomes more logical and systematic. Therefore, the child is able to understand the link between the cause and effect, and can look at the same situation from different points. However, the child still focus is on the present and his or her thinking is unable to apply hypothetical or abstract ways of thinking (Bush, 1996). At the fourth stage (the formal operational stage) begins when the child is 12 years and continues through adulthood. The child is able to apply hypothetical situations or abstract ways of thinking. However, individuals need attention and motivation to be able to do this at the most advanced cognitive developmental stage. Therefore, adults are not necessarily operate on this level in certain situations (Bush, 1996).

2.2 Literature Review of Children's Experience with Medicines Use

Few studies have been conducted to explore children's knowledge, attitudes and beliefs towards medicines in developing countries and especially in Malaysia.

Previous studies have described that the main problem is that of expectations of using medicines among children, self-medication and in addition, evaluating the factors associated with their knowledge, attitudes and beliefs regarding medicines.

2.2.1 Self-Medication among Children

There are some studies that have been conducted on the autonomy of children in taking medicines (Bush *et al.*, 1985; Chambers *et al.*, 1997; Geissler *et al.*, 2000; Hameen-Anttila *et al.*, 2005; Rudolf *et al.*, 1993). In Canada, a study by Chambers *et al.* (1997) about the self administration of OTC medicine was conducted among 651 adolescents in three public upper secondary schools. Using OTC for headache, stomach ache, sore throat, muscle, joint and menstrual pains were evaluated among adolescents from grades 7 to 9. This study showed that many adolescents 58.7% - 95.9% reported taking OTC medications for pain on their own. Self- administration of OTC medicine without informing adults began from 11-12 years old and increased with age for all types of pain. Furthermore, girls had a tendency to self medicate more than boys.

In Kenya, Geissler *et al.* (2000) studied primary schoolchildren's health seeking behaviour in response to common illnesses. Total fifty seven schoolchildren were interviewed weekly about their health status and health seeking behaviour for 30 weeks. Children could be categorized according to four groups: cold, headache, abdominal complaints and injuries. Only 28% of children consulted adults to take medicine, while 72% of them took medicine on their own. The self-treatment by

using medicines increased with age. The girls showed lower self-treatment to their illness compared to boys. The boys tended to self administer pharmaceutical medicines more than girls in the different age groups.

A study by Holstein *et al.* (2003) in Denmark reported on medicine use among children in the ages of 11-15 years old in that past month for common health problems. In their finding, it was most common for children to take medicines for headache and stomach ache. Pain reliever use was higher among girls than boys and this gender difference increased with age. Furthermore, high percentage of girls was frequent users of medicine for headache, stomach ache, and sleeping problems. It was recommended that more information about medicines be incorporated into health education programmes in the future.

In Kuwait, Abahussain *et al.* (2005) carried out a survey among adolescents from high school to evaluate the pattern of medicines use and the self-medication among them. High percentage of adolescents (65%) used medicines on their own for pain and 54% for respiratory infections. The prevalence of self-medication among adolescents in Kuwait increased by age from 87% among 14 years old to 95% among 18 years old. Furthermore, females were more familiar with painkillers, respiratory medicines and hair products to self-medicate. In addition, anti dandruff and athlete's preparations medicines were used more by males.

2.2.2 Parents' Self-Medication of their Children

Few studies have been done about family self-medication for children and the prevalence of self-medication among parents. In Nigeria, Oshikoya *et al.* (2007) conducted a study among schoolchildren from 20 public and private schools. The children were given a simple questionnaire to give to their mothers. In this study, children who suffered an illness in the month before the study were 604. Only 60% of mothers went for hospital care while 40% of them preferred the self-medication way to care for their children. The most frequent use of self-medication among parents was cough mixture, ascorbic acid and cotrimoxazole. These medicines were most commonly kept at home by the mothers. Self-medication among children in Nigeria is common. The existing policy about the use and sale of over the counter medicines, prescribed and non-prescribed medicines should be strengthened to ensure rational use of medicines.

2.2.3 Children and Medicine Education

The irrational use of medicine is a serious problem in developing countries. It is important to solve it through the provision of safe, efficacious and affordable drugs, through strengthening the drug regulatory systems and through the education of health care providers. However, it is important to provide the population about the proper use of medicines. Educating children in developing countries about the proper use of medicines is a strategy that has the possibility to improve medicines use in the community where the children live and for future generations. Currently, very few children's health education curricula include information about the proper use of

medicines, and what children do not know about medicines, or their behaviour or expectations relative to medicines in the context of their cultures (Bush & Hardon, 1990).

In Finland, Hameen-Anttila *et al.* (2004) conducted a study about children's interest to be taught about medicines. The teachers had also requested of their opinion about the topics that should be included about medicines for different age groups in school health curricula in Finnish primary schools. Children were interested to know about medicines in different age groups and their teachers' opinions were similar. Most teachers (93%) referred to the proper use of medicines as an important topic that should be included in the national curriculum of health education. However, children aged 10-11 years old were most interested to know about medicines, for example, how medicines work, how to avoid adverse reactions, and abuse of medicines while teachers said that these topics were suitable for older children.

2.2.4 Children's Knowledge, Attitudes and Beliefs about Medicines

In America, a study by Almarsdottir and Zimmer, (1998) was conducted among children aged 7 years and 10 years to investigate their knowledge about medicines. The study indicated that children's knowledge about medicines was influenced by age, education level of the parents and health locus of control. The education level of the primary caregiver was measured. Children who have graduate caregivers had higher score of knowledge than that of the children whose caregiver had low

education level. Furthermore, children's internal locus of control was a factor to increase their knowledge about medicines.

In Germany, a study was conducted among adolescents to investigate their self-medication behaviour and their basic knowledge about medicines. Most adolescents (57%) used different medicines two weeks before the survey. Some of them were used for headache remedies several times per month. The level of knowledge about medicines was influenced by previous medicines consumption. Furthermore, females had better medicines knowledge compared to males. The basic knowledge about the proper use of medicines is required to decrease the potential risk of medicines especially in case of self-medication (Stoelben *et al.*, 2000).

In India, Desai *et al.* (2005) evaluated children's knowledge and awareness about medicines among primary schoolchildren. Children's attitudes and beliefs about medicines were assessed through simple questions. Children were asked using questionnaire about medicines, vaccines and first aid box. The majority (75%) of the children were familiar with the term "medicine" while some of them knew about the uses and contents of the first aid box, while only 7% of them answered correctly about the preventive value of vaccines. There was lack of awareness about the risk of taking medicines among children. Additionally, children did not have enough knowledge about the right way to take medicines and about other aspects of medicines use. Additionally, most children did not know about vaccines or about the contents of first aid box. Medicine education should be included in the school health

curriculum for these children. This will help them to make the right decisions while using medicines.

In other studies, children's understanding about medicine during management of their disease was evaluated. A focused group discussion was carried out among Finnish schoolchildren in age groups of 7–8, 10–11 and 13–14 years old. Most children in different age groups had superficial knowledge and negative attitudes towards medicines use. Children reported that there may be risks when using medicines and this understanding increased with age. Furthermore, this study indicated a need to educate children about medicines through their school health curricula. The health care professionals should communicate with children about their medicines at an appropriate cognitive level in order to increase their comprehension and skills about health issues (Hameen-Anttila *et al.*, 2006).

In Malta, children's knowledge about medicines and their sources of information about medicines was investigated among secondary schoolchildren. The efficacy of medicines, the safety of medicine, and antibiotic use and pictogram were the main topics to evaluate children's knowledge about medicines. High percentage of children (30%) did not answer correctly the questions that assessed their knowledge of medicines. Furthermore, the sources of information about medicines were family physicians, the community pharmacist and parents. However, the level of knowledge about medicines among Maltese children was high and the girls were more knowledgeable about medicines than boys. Some misconceptions about the

important aspects of proper use of medicines emerged from this study. This study is important to provide children with basic information about the proper use of medicines (Darmanin Ellul *et al.*, 2008).

Hameen-Anttila & Bush (2008) conducted a review of literature from 17 countries to describe children's knowledge, attitudes, and beliefs about medicines. According to the researchers, most of the previous studies indicated that the age of the children was a factor which influenced their understanding about medicines. However, schoolchildren in different age groups tend to view medicines cautiously and children have very little information about how medicines work. There is a misconception about the efficacy of medicines among children. Furthermore, young children were able to identify that medicines may cause harmful effects and, while children from all age groups and cultures studied shows interest to learn more about medicines. The autonomy of children in using medicine is unexpectedly high and their knowledge about medicines is poor (Hameen-Anttila & Bush, 2008).

In Greece, a study by Bozoni *et al.* (2006) was carried out among 360 primary schoolchildren from three age groups, 6–7, 8–9, and 10–11 years old to evaluate their perception and knowledge about medicines. This study indicated that most of the children believe strongly in the therapeutic effects of medicines independent of age or socioeconomic status. Children's knowledge about medicines increased with age while the gender had no significant impact on their perception and beliefs about medicines. Furthermore, children of higher SES were more knowledgeable about

medicines comparing with those of lower SES. Most children referred to their parents or the physician as the sources of information among them while the children of lower SES used other sources like reading about medicines or from the media. The age and the SES have a significant effect on the information sourcing method. The accessibility to home medicines increased with age. The planning about school-based health education programmes is needed especially about medicine education in different types of schools.

In Malaysia, a preliminary study was conducted by Dawood *et al.* (2009) among schoolchildren from grade 4 to 6 to evaluate their knowledge and attitudes about using medicines in the treatment of common minor ailments. This study indicated that age of children was a significant factor to affect their knowledge while the gender of children did not affect their knowledge about using medicines. This study reported that children in different age groups have superficial knowledge about the proper use of medicines to treat their minor ailments. Therefore, providing children with simple information about their ailments is needed and the role of the health care professionals should be increased to communicate with children about their illnesses.

2.2.5 Sources of Information about Medicines among Children

The common source of information about medicines among children refers to how children receive information and from whom. The source of information about medicines among children from different age groups originates from the parents. In United States children aged 5-14 years old, Greece ages 6-11 years old, Canada ages

12-15 years old and Finland ages 11-17 years old reported that the parents were the common source of information among them, especially the mother (Chambers *et al.*, 1997; Hameen-Anttila *et al.*, 2005; Menacker *et al.*, 1999).

In a German study, children aged 15-17 years old indicated that the common sources of information were the medicine package and they referred to their parents as the last source for information about medicines (Chambers *et al.*, 1997; Stoelben *et al.*, 2000). Another source of information about medicines was physicians and nurses (Bozoni *et al.*, 2006; Chambers *et al.*, 1997; Stoelben *et al.*, 2000). In another study, Greek children reported their teachers as second source of information with the physicians (Bozoni *et al.*, 2006); while in Canada and Finland, the teachers were not considered as a source of information about medicines. In addition, the internet was not a common source of information according to the Finnish children (Hameen-Anttila *et al.*, 2005).

2.3 Conceptual Framework

This study was designed to evaluate the knowledge, attitudes and beliefs regarding medicines among primary schoolchildren. The children's knowledge, attitudes and beliefs about medicines are affected by many factors, some relating to the community and some relating to health care system. The conceptual framework presented below represents the possible causal relationships between the independent variables in this research and the knowledge, attitudes and beliefs regarding medicines among children. It was generated based on findings from previous studies.

The independent variables included children’s age, gender, ethnicity and educational level of their parents, parents’ occupation and the socio-economic status of the family. The dependent variables were the knowledge, attitudes and beliefs towards medicines. The goal of this study is to measure the current knowledge, attitudes and beliefs about medicines among children and to investigate the relationship of independent variables with knowledge, attitudes and beliefs which may affect medicine taking behaviour among children in Malaysia. Figure 1 below shows the factors influencing medicine taking behaviour among children.

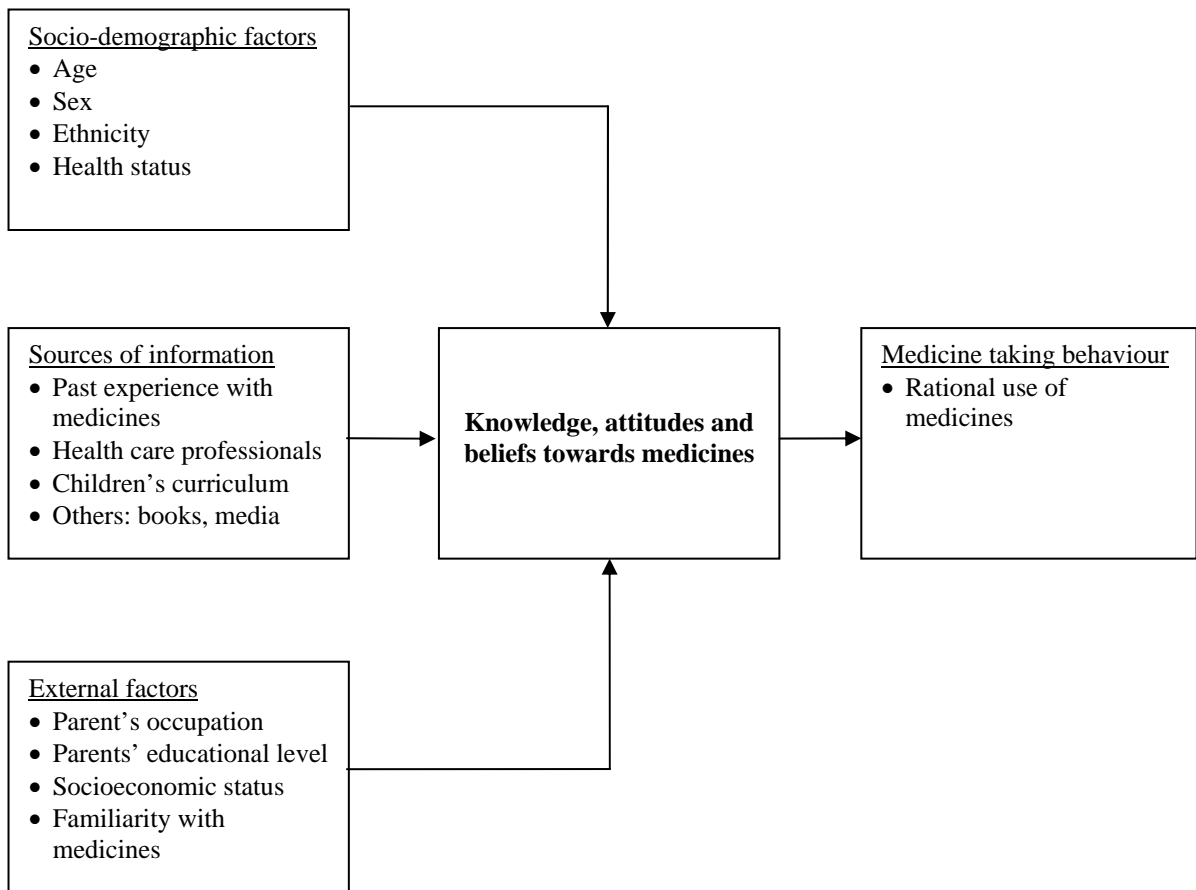


Figure 2.1: Conceptual framework for this study

2.3.1 Knowledge, Attitudes and Beliefs about Medicines

Very little is known about the perception of primary schoolchildren of the meaning of medicine (Bush *et al.*, 1996) and the factors influencing medicine knowledge among children and adolescents (Almarsdottir & Zimmer, 1998; Stoelben *et al.*, 2000). Some studies have evaluated the attitudes and behaviour related to medicine use in teenage populations, but little is known about medicine use by pre-teenage children. Furthermore, there is little knowledge of the prevalence of medicine use in this population, the reasons why some of them are using medicines, and their experiences of medicine use (Boreham & Shaw, 2001; Manning *et al.*, 2001; Power *et al.*, 1996; Smit *et al.*, 2002; Wibberley & Price, 2000).

Regarding the efficacy of medicines, children may believe that the physical attributes of medicines are related to their efficacy, and they believed that the cheaper medicines are not as effective as more expensive medicines or the place whether the medicines bought may influence their effectiveness (Bush *et al.*, 1985; Menacker *et al.*, 1999). Children also reported that medicines should be taken only for illness (Garcia *et al.*, 1996; Hameen-Anttila *et al.*, 2006; Vaskilampi *et al.*, 1996).

In other studies, it was found that children aged 5-14 years old were observed to have fear of taking medicines. However, children's attitude towards medicines use is very positive to recovering during illness (Almarsdottir *et al.*, 1997; Bush & Joshi, 2002; Menacker *et al.*, 1999). In addition, children perceived that the risks of

medicines are related to taking the wrong medicine or taking medicine for a different illness (Bush & Joshi, 2002; Hameen-Anttila *et al.*, 2006; Menacker *et al.*, 1999).

In addition, children referred to the risks of medicine when someone taking medicines without having a disease or the medicine can be unsafe when taken by someone who is allergic to certain medicines, or when taken at the wrong time (Gerrits *et al.*, 1996). The harmful effects of medicines have been reported by children in many countries (Garcia *et al.*, 1996; Hameen-Anttila *et al.*, 2006; Menacker *et al.*, 1999; Bush & Joshi, 2002).

2.3.2 Socio-Demographic Factors

Age- The lack of knowledge about medicines among children is a recurrent theme has emerged in previous studies. Children do not know how medicines work (Aramburuzabala *et al.*, 1996; Menacker *et al.*, 1999). However, the age is a predictor factor indicated that children's understanding about medicines increases with age (Bush & Joshi, 2002; Menacker *et al.*, 1999).

Gender- Some studies reported that the gender of children may influence their knowledge about medicines. In addition, the consumption of medicines tend to be high among females compared to males (Stoelben *et al.*, 2000). Females tend to obtain information about medicines from medical professionals (Darmanin Ellul *et al.*, 2008).

Ethnicity- Different cultures have different norms and values. The content and sources of learning experience are expected to differ across cultures (Moschis, 1987). Children have attitudes, beliefs and expectation about medicines or autonomy in taking medicines without informing their parents. Moreover, children's attitudes, beliefs and behaviours towards treatment that is possibly different for each child, but is created by the surrounding culture (Bush *et al.*, 1985).

Health status- Health status is expected to affect the learning process (Hudson & Brown, 1983). Children who suffer from illness tend to obtain the knowledge about their illness.

2.3.3 Sources of Information about Medicines

Past experience with medicines- Children may have experience to use medicines since they were young. Children were asked if they ever used medicines. This may increase their information about medicines (Menacker *et al.*, 1999).

Health care professionals- The communication with the formal health care providers such as physician or pharmacist is a factor that may influence children's knowledge about medicines (Chambers *et al.*, 1997).

School curriculum- Children spend most of their time in school. Very few studies have evaluated the effects of school on children sources of information about medicines (Moschis, 1987).

Others, books and media- Medicines are promoted through the television, radio or printed advertisements and books (Desai *et al.*, 2005). Children may get information about medicines through their observation, reading or through the internet.

2.3.4 External Factors

Parents' occupation- Most children get their information about medicines from their parents. If the children have one of the parents working as a health care professional, this may influence their knowledge about medicines (Bozoni *et al.*, 2006).

Parents' educational level- The education level of the parents may influence their knowledge about medicines through passing and sharing their knowledge about medicines to their children (Almarsdottir & Zimmer, 1998).

Socio-economic status- Children who have family with high SES of children tend to have more frequent visits to primary health care services and they would have obtained the information about medicines during these frequent visits (Nadel, 1993).

Familiarity with medicines- Children accessibility to home medicines, availability of medicines at home and observing family members taking medicines may increase their information about medicines (Bozoni *et al.*, 2006). Some children suffer from chronic illness such as asthma, and they have to take medicines for a long period.

2.4 Research Hypotheses

Based on the above arguments and previous studies, the following hypotheses were developed:

- There is a significant difference in knowledge, attitudes and beliefs regarding medicines among children related to their age.
- There is a significant difference in knowledge, attitudes and beliefs regarding medicines among children related to their gender.
- There is a significant difference in knowledge, attitudes and beliefs towards the medicines among children related to their ethnicity.
- There is a significant difference in knowledge, attitudes and beliefs among children whose parents have high vs. low educational level.
- Children who live in family with high socio-economic status have high scores of knowledge, attitudes and beliefs towards medicines.
- There is a significant relationship between attitude and belief, and knowledge.

2.5 Research Questions

This study has several research questions:

- What are the current knowledge, attitudes and beliefs among children regarding medicines in Malaysia?
- Are children's knowledge, attitudes and beliefs influenced by age, gender or ethnicity?
- Does the socioeconomic status or educational level of their parents affect the knowledge, attitudes and beliefs regarding medicines among children?