Pharmacy Education (2024) 24(1) 757 - 764
https://doi.org/10.46542/pe.2024.241.757764

RESEARCH ARTICLE

Assessing the impact of the 'Know Your Medicine' programme on medication literacy among children aged 10–12 years in Selangor, Malaysia: A pre- and post-survey intervention study

Nur Wahida Zulkifli[1,2], Nor Elyzatul Akma Hamdan[2], Nur Sabiha Md Hussin[2], Norkasihan Ibrahim[1,2], Mahmathi Karuppannan[2], Kamaliah Md Saman[2]

[1] Center for Drug Policy and Health Economic Research (CDPHER), Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Selangor Branch, Puncak Alam Campus, Selangor, Malaysia
[2] Department of Pharmacy Practice and Clinical Pharmacy, Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Selangor Branch, Puncak Alam Campus, Selangor, Malaysia

Keywords
Educational programme
Intervention effectiveness
Malaysia
Medication literacy
Primary schoolchild

Correspondence
Nor Elyzatul Akma Hamdan
Department of Pharmacy Practice and Clinical Pharmacy
Faculty of Pharmacy
Universiti Teknologi MARA (UiTM)
Selangor Branch
Puncak Alam Campus
Selangor
Malaysia
elyzatul@uitm.edu.my

Abstract

Background: Despite efforts to educate the public about medication starting from an early age, there remains a scarcity of medication-related programs and accessible resources specifically designed for children. This study aims to evaluate the effectiveness of the 'Know Your Medicine' programme in enhancing medication literacy among primary schoolchildren in Malaysia. **Methods:** This interventional study compared pre- and post-knowledge scores in a non-randomised, one-group pre-test-post-test experimental design. Primary schoolchildren aged 10–12 years old participating in the 'Know Your Medicine' programme engaged in informative sessions and interactive activities. Eleven validated questionnaires were administered before and after the intervention to measure changes in medication knowledge levels. **Results:** A total of 81 primary schoolchildren completed the study. The mean baseline knowledge score was 6.88 and 7.85 pre-test and post-test, respectively. A Wilcoxon signed-rank test confirmed a statistically significant improvement in medication knowledge following the intervention ($Z = -4.345$, $p < 0.001$). **Conclusion:** The findings reveal the effectiveness of the 'Know Your Medicine' programme in enhancing medication literacy among primary schoolchildren in Malaysia, highlighting the importance of implementing targeted educational interventions to improve medication knowledge among primary schoolchildren.

Introduction

In the pursuit of global strategies outlined by the World Health Organisation (WHO) to promote the rational use of medicines, Malaysia has taken significant strides by initiating the "*Know Your Medicine*" (KYM) national health campaign in 2007 (World Health Organisation, 2007). This campaign underscores the importance of policy coordination, unbiased information dissemination, and public education on medicines. The KYM's programme aims to educate the public and promote the quality use of medicine through patient education, such as training modules, printed and digital promotional materials, talks, and media appearances on television, radio, newspapers, and social media platforms (Pharmaceutical Services Division, 2022).

Medication literacy is the capacity to understand, evaluate, and apply medication-related information to make informed decisions (Sørensen *et al.,* 2012). In the context of children, fostering medication literacy from an early age is essential as it lays the exposure for responsible and effective healthcare management. The

significance of medication literacy among children becomes particularly pronounced in determining treatment outcomes, as their understanding of medication use may influence adherence and, consequently, the efficacy of therapeutic interventions (Merks *et al.,* 2021). Research indicates inadequate medication literacy can lead to medication errors, compromised treatment effectiveness, and increased healthcare costs (Glick *et al.,* 2019). Another study emphasises that individuals with limited health literacy are more prone to misunderstand prescription instructions, leading to improper medication use (Wolf *et al.,* 2006).

A qualitative study conducted among pediatric parents reported that low medication literacy has been associated with decreased medication adherence and, consequently, worse health outcomes (Rungvivatjarus *et al.,* 2023). Another study involving adolescents in Taiwan demonstrated that those with lower levels of medication knowledge were more likely to engage in inappropriate self-medication practices (Lee *et al.,* 2017). Another clinical trial examining the efficacy of medication literacy programmes revealed that an educational intervention enhanced medication knowledge, self-efficacy, and overall literacy among adolescents, thus reducing the likelihood of adolescents engaging in inappropriate self-medication practices (Maldonado *et al.,* 2007).

Early childhood intervention is crucial for fostering the development of positive health-related behaviours, mitigating future health risks, and contributing to cognitive and socio-emotional development, as children who undergo targeted interventions exhibit improved cognitive abilities (Fretian *et al.,* 2020; Black *et al.,* 2021). Despite the belief that children are too young to take responsibility and manage their medications independently, early exposure to medication education can improve their attitudes and behaviours towards medication in the future. (Hampson *et al.,* 2015). A study among children in the United States emphasised the importance of age-appropriate educational interventions in fostering children's knowledge (Cohen *et al.,* 2022). Moreover, children exposed to relevant and accessible educational interventions are better equipped to understand the purpose of medications, how to take them appropriately, and the potential consequences of improper use (Cohen *et al.,* 2022).

The escalating prevalence of chronic diseases among Malaysian children, notably childhood obesity, presents a substantial public health concern due to its established association with heightened risks of diverse chronic conditions, including diabetes, hypertension, and metabolic syndrome (Mansor & Harun, 2014). Thus, it is essential to ensure children's active participation in managing their health and well-being.

The Ministry of Health in Malaysia has taken the initiative to address medication literacy among children by developing dedicated medication-related modules. These modules have been integrated into the primary school health curriculum under the rational use of medicine syllabus (Azhar *et al.,* 2017). Trained pharmacists have systematically conducted educational training on medication through mass lectures, workshops, and small group sessions. However, despite commendable efforts, the implementation of rational use of medicine programmes in primary schools remains scarce, leading to gaps in knowledge that could potentially impact medication safety among this age group. Children aged 10–12 years are at a critical developmental stage where understanding medication safety is crucial. The lack of consistent educational interventions may contribute to misconceptions and unsafe practices related to medication use. Given the lack of medication-related programmes for primary schoolchildren, the Faculty of Pharmacy, Universiti Teknologi Mara, initiated the KYM programme, a comprehensive educational intervention designed to address these issues. Despite the programme's potential, there is a notable lack of studies that evaluate its effectiveness in improving medication literacy among primary school children. Therefore, this study aimed to assess the impact of the KYM programme on the medication knowledge and safety practices of primary schoolchildren aged 10–12 years in Puncak Alam, Selangor, Malaysia. It also sought to determine the extent to which the lack of prior medication-related programmes has affected the children's understanding of medication safety and evaluate whether the intervention can bridge this critical knowledge gap.

Methods

Study design

Following the methodology proposed by Fraenkel and Wallen (1990), a one-group pre-test-post-test experimental design was adopted for this study to evaluate changes in knowledge levels before and after the intervention. The structure of the experimental design is presented in Table I.

Table I: One-group pre-test-post-test experimental design

Pre-test	Intervention	Post-test
Primary schoolchildren completed a questionnaire about their knowledge of the rational use of medicine.	Participants attended the KYM's programme. Primary schoolchildren participated in a talk titled "Antibiotic Resistance." They then visited each booth during the programme. Interactive activities related to the information and content delivered in the booth's programme, including crossword puzzles, hidden pictures, fill-in-the-blank activities, and quizzes, were conducted.	Primary schoolchildren completed a questionnaire about their knowledge of the rational use of medicine.

Intervention

The KYM programme was conducted physically at the Faculty of Pharmacy, UiTM. It aimed to assess the impact of the KYM's programme on the medication knowledge of primary school children.

Primary schoolchildren who attended the programme engaged in informative sessions, including a talk on antibiotic resistance aimed at enhancing their understanding of this critical topic and encouraging active participation. The content covered during this talk was later reinforced through interactive activities at various booths, each addressing specific aspects related to medication literacy, including topics such as the rational use of medicine (e.g. proper dosage and administration), the principles of antibiotic resistance (e.g. the importance of completing the prescribed course), and medication adherence (e.g. the importance of adhering to medication schedules).

Interactive activities at the booth included crossword puzzles, hidden pictures, fill-in-the-blanks, and quizzes. First-year pharmacy students from UiTM were responsible for creating and delivering the content and facilitating activities at each booth. The content and activities were meticulously reviewed and discussed by a pharmacist lecturer. The programme's effectiveness was measured through questionnaires administered to primary schoolchildren before and after they participated in the intervention.

Instrument

Based on the topics covered during the talk and at various booths during the programme, a simple and structured questionnaire of 11 questions was developed in English and Malay. The questionnaire was printed in both languages. The same set of questions was used for the pre-test and post-test. Figure 1 illustrates the flow of the study.

Answers to the pre-test and post-test were in the form of either "*Yes*," "*No*," or "*Do not know*." A maximum score of 11 was possible for each test when all the questions were answered correctly. Correct answers were given one mark, while incorrect answers were marked with zero.

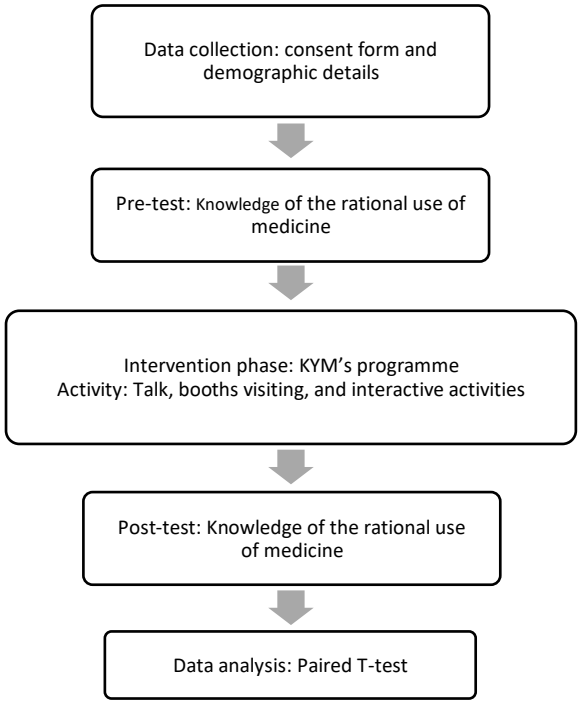

Figure 1: Flow of the study

Teachers assisted the participants in answering the questionnaire by reading the questions and answer options. They were instructed not to guide participants to the correct answers but to encourage them to answer based on their understanding.

The questionnaire was face and content validated by a panel of four expert academic pharmacists with extensive experience in the field before being distributed to participants. The questionnaire showed good internal consistency and reliability with a Cronbach's alpha value of 0.70 and good inter-rater reliability with a kappa coefficient of 0.85, based on a sample of 81 participants.

Sample

Primary schoolchildren aged 10–12 years old in 2023 from Puncak Alam Primary School were eligible to participate. Those who did not attend the KYM programme and those unable to understand Malay or English were excluded.

Data analysis

Knowledge levels were categorised into three tiers, following Bloom's cutoff criteria: high (80–100%), moderate (60–79%), and low (<60%) (Bloom, 1956). The corresponding tiers for a maximum score of 11 were as follows: high (9–11; 80–100%), moderate (6–8; 60–79%), and low (0–5; < 60%).

Descriptive analysis was used to describe the sample distribution and demographic data. Statistical analysis was performed using SPSS version 21.0. The Wilcoxon signed-ranked test was used to assess score differences pre- and post-intervention within the same group. The McNemar test was used to compare categorical data. The significance level was set at $\alpha < 0.05$.

Results

A total of 81 primary schoolchildren participated in the study. Table II provides the details of participants' demographic characteristics.

Table II: Sociodemographic characteristics (n = 81)

Characteristics	Number of children (%)
Age (years)	
10	16 (20)
11	23 (28)
12	42 (52)
Gender	
Male	21 (26)
Female	60 (74)

Children's knowledge levels before and after the intervention are presented in Table III.

Table III: Participants' knowledge levels of the rational use of medicine before and after the intervention

Knowledge level	Pre-test n (%)	Post-test n (%)
Low	12 (14.8)	1 (1.2)
Moderate	61 (75.3)	58 (71.6)
High	8 (9.9)	21 (25.9)

Pre-test knowledge levels were as follows: 14.8% (n = 12) low, 75.3% (n = 61) moderate, and 9.9% (n = 8) high. Post-intervention, only 1.2% (n = 1) had a low knowledge, while 71.6% (n = 58) had moderate knowledge, and 25.9% (n = 21) were classified as having a high knowledge level. A Wilcoxon signed-rank test (Table IV) showed that the KYM programme among primary school children significantly increased the knowledge about the rational use of medicine ($Z = -4.345$; $p < 0.001$).

Table IV: Effect of KYM on the rational use of medicine among primary schoolchildren

Knowledge level			
Mean score		Z[a]	*p*-value
Pre-test	Post-test		
6.8765	7.8500	-4.345[a]	<0.001

[a] Wilcoxon signed-rank test

Improvements were also evident and significant in each question of the pre-and post-test. Table V presents a summary of the results for each question, comparing pre-test and post-test assessments.

Table V: Children's knowledge pre- and post-test

Question	Correct answers (%)		[a]*p*-value
	Pre-test	Post-test	
1. All medicines must be registered under the Ministry of Health Malaysia.	93.8	97.5	<0.001
2. The labels on medicines contain the name of the medicine, dosage, and timing.	92.6	96.3	<0.001
3. All medicines should be stored in the refrigerator.	22.2	93.8	<0.001
4. Medicines should not be stored in high-temperature areas.	55.6	92.5	<0.001
5. Unused medicines should be disposed of in the sink.	65.4	85.0	<0.001
6. Certain antibiotics can lead to antibiotic resistance.	22.2	58.8	<0.001
7. Everyone can consume natural health products.	13.6	17.5	<0.001
8. All natural health products are safe to consume as they do not cause side effects.	18.5	28.8	<0.001
9. Correct dosage of medicine is essential to ensure their effectiveness.	79.0	92.5	<0.001
10. The medication dosage for children is determined by their body weight.	58.0	93.8	<0.001
11. If you forget to take your medicine, you should take a double dose whenever you remember.	54.3	76.3	<0.001

[a] McNemar test

Discussion

This study aimed to evaluate the effectiveness of the KYM programme in enhancing medication literacy among 81 primary schoolchildren in Malaysia. The findings demonstrate a significant improvement in post-intervention knowledge scores, particularly medication storage and awareness of antibiotic resistance. Consistent with these findings, other studies have reported significant improvements in the understanding of appropriate medication storage practices and the dangers of antibiotic resistance when targeted educational interventions were implemented (West & Cordina, 2019). However, some studies indicate varying levels of awareness and compliance, especially in different demographic groups, suggesting that cultural, educational, or socioeconomic factors may influence these behaviours (Torres *et al.,* 2019). These mixed results underscore the necessity for tailored approaches in public health education to address the specific needs of various populations.

The findings of the present study revealed only a slight increase in awareness of medication registration, labelling, and natural health products. Similarly, a modest improvement has been observed in the understanding of medication labels among children after a brief educational session (Zito *et al*., 2008), suggesting that younger audiences may require repeated or more engaging interventions to achieve substantial gains in knowledge. In contrast, research has demonstrated a significant increase in awareness following a more intensive and longer-duration educational approach (White & Pitts, 1998). Another study showed no significant changes in children's understanding of natural health product safety after a single intervention (Luz *et al.,* 2022). These mixed results suggest that while educational interventions can be beneficial, their design and implementation must be carefully tailored to the target audience to maximise effectiveness.

A significant improvement was found in the total knowledge score post-intervention, suggesting that integrating medication literacy into the primary school curriculum could significantly enhance children's understanding of the rational use of medication. Indeed, a health promotion programme in Taiwan, conducted in collaboration with community pharmacists, enhanced medication knowledge, self-efficacy, and literacy among school students (Chang *et al.,* 2015). Similarly, an outreach programme in the United States targeting middle-school students showed that educational initiatives improved students' knowledge of safe medication use (Meadows, 2006). These findings align with the positive changes observed in the current study, indicating that targeted educational initiatives effectively enhance children's understanding of medication use. Nevertheless, the KYM programme implemented in the present study significantly enhanced primary schoolchildren's knowledge, elevating it from a low to a higher level following the intervention. Prior research has revealed that an educational intervention led by pharmacy students could lead to notable knowledge improvements among elementary school students across all health-related subjects covered in the programme (Matson *et al.,* 2019). The same study found that interactive sessions, educational materials, and engaging games substantially increased students' understanding of medication safety (Matson *et al.,* 2019). These results parallel the positive changes observed in the present study, suggesting that this enhancement in medication literacy among children is crucial for promoting responsible self-care and ensuring safe medication practices.

Incorporating medication literacy into the primary school curriculum offers a crucial opportunity to provide the foundational knowledge essential for the health and well-being of young children. Research has found that early exposure to medication education fosters responsible medication use and enhances health literacy skills among children (Institute of Medicine (US) Committee on Health Literacy, 2004). By integrating medication literacy into topics like science and health education, primary schools can instil essential concepts such as medication safety, dosage, and adherence to prescribed regimens (Marks, 2012). This approach empowers children to make informed health decisions and cultivates a proactive attitude to healthcare management from an early age, thus promoting lifelong habits of self-care and wellness (Institute of Medicine (US) Committee on Health Literacy, 2004). Given the positive outcomes observed in this study, integrating such programmes into the broader educational framework could significantly contribute to public health efforts by equipping future generations with the knowledge and skills necessary for safe medication practices. Continued research with larger and more diverse samples is warranted to validate these findings and further understand the long-term impact of early medication education.

Limitations

This study could demonstrate the positive impact of a targeted educational intervention on improving medication literacy among primary schoolchildren. The pre- and post-intervention design provided evidence of knowledge gains, highlighting the intervention's effectiveness in a specific population. However, the sample size of 81 participants from a single, relatively homogeneous school limits the findings'

generalisability. The lack of demographic diversity means the results may not fully reflect medication literacy across different socioeconomic and cultural groups.

Future research should aim to involve larger and more diverse populations to enhance the applicability of the findings and consider longitudinal approaches to assess the long-term retention of medication knowledge.

Conclusion

The study's main objective was to measure the effectiveness of the KYM programme in imparting knowledge to primary schoolchildren. The KYM programme significantly improved medication literacy among primary schoolchildren through several specific aspects of interventional activities, such as educational methods, engagement strategies, and interactive elements. Overall, this study provides valuable insights into the intricate matter of medication literacy by providing evidence of the beneficial effect of early-stage health-related educational interventions.

Ethics approval and informed consent

The Universiti Teknologi MARA Research Ethics Committee [REC/05/2023 (ST/MR/143)] approved the study protocol. Informed consent and assent were obtained from parents and children, respectively, before the survey began.

Acknowledgement

The research team extends their gratitude to all the pharmacy students involved in this study. The authors also sincerely appreciate the teachers and primary school children who participated in the program.

Conflict of interest

The authors declare no conflict of interest.

Source of funding

This study was supported by the Community Engagement Social Innovation and Research Grant from UiTM under grant number 600-RMC/CE-SIR 5/3 (015/2023). The authors would like to express their gratitude for this financial support.

References

Azhar A., Shiek Li L., & Salleh M. S. (2016). Know medicine. In *Physical education and health year 1* (p. 69–72). FirstDewan Bahasa dan Pustaka.

Black, M., Barnes, A., Strong, M., Brook, A., Ray, A., Holden, B., Foster, C., & Taylor-Robinson, D. (2021). Relationships between Child Development at School Entry and Adolescent Health—A Participatory Systematic Review. *International Journal of Environmental Research and Public Health,* **18**(21), 11613. https://doi.org/10.3390/ijerph182111613

Bloom B. S. (1956). *Taxonomy education.* David McKay.

Chang, F. C., Chi, H. Y., Huang, L. J., Lee, C. H., Yang, J. L., & Yeh, M. K. (2015). Developing school-pharmacist partnerships to enhance correct medication use and pain medication literacy in Taiwan. *Journal of the American Pharmacists Association: JAPhA,* **55**(6), 595–602. https://doi.org/10.1331/JAPhA.2015.15053

Cohen, A., Vakharia, S. P., Netherland, J., & Frederique, K. (2022). How the war on drugs impacts social determinants of health beyond the criminal legal system. *Annals of Medicine,* **54**(1), 2024–2038. https://doi.org/10.1080/07853890.2022.2100926

Fraenkel, J. R., & Wallen, N. E. (1990). *How to design and evaluate research in education*. Order Department, McGraw Hill Publishing Co.

Fretian, A., Bollweg, T. M., Okan, O., Pinheiro, P., & Bauer, U. (2020). Exploring associated factors of subjective health literacy in school-aged children. *International Journal of Environmental Research and Public Health,* **17**(5), 1720. https://doi.org/10.3390/ijerph17051720

Glick, A. F., Farkas, J. S., Mendelsohn, A. L., Fierman, A. H., Tomopoulos, S., Rosenberg, R. E., Dreyer, B. P., Melgar, J., Varriano, J., & Yin, H. S. (2019). Discharge instruction comprehension and adherence errors: Interrelationship between plan complexity and parent health literacy. *The Journal of Pediatrics,* **214**, 193–200.e3. https://doi.org/10.1016/j.jpeds.2019.04.052

Hampson S. E., Edmonds G. W., Goldberg L. R., Dubanoski J. P., Hillier T. A. (2015). A life-span behavioral mechanism relating childhood conscientiousness to adult clinical health. *Health Psychology,* **34** (9), 887–895. https://doi.org/10.1037/hea0000209

Institute of Medicine (US) Committee on Health Literacy, Nielsen-Bohlman, L., Panzer, A. M., & Kindig, D. A. (Eds.). (2004). *Health literacy: A prescription to end confusion*. National Academies Press (US). https://doi.org/10.17226/10883

Lee, C. H., Chang, F. C., Hsu, S. D., Chi, H. Y., Huang, L. J., & Yeh, M. K. (2017). Inappropriate self-medication among adolescents and its association with lower medication

literacy and substance use. *PLoS ONE,* **12**(12), e0189199. https://doi.org/10.1371/journal.pone.0189199

Luz, R. M. D., Marinho, D. C. B., Lima, A. P. E., & Coriolano-Marinus, M. W. L. (2022). Educational interventions in child development and health literacy assumptions: An integrative review. *Revista Brasileira de Enfermagem*, **76**(1), e20220116. https://doi.org/10.1590/0034-7167-2022-0116

Maldonado, J. C., Meléndez, S. D., & Figueras, A. (2007). Long-term effects of an educational intervention on self-medication and appropriate drug use in single-sex secondary public schools, Quito, Ecuador. *British Journal of Clinical Pharmacology,* **63**(1), 92–99. https://doi.org/10.1111/j.1365-2125.2006.02749.x

Mansor, M., & Harun, N. Z. (2014). Health issues and awareness, and the significant of green space for health promotion in Malaysia. *Procedia-Social and Behavioral Sciences,* **153**, 209–220. https://doi.org/10.1016/j.sbspro.2014.10.055

Marks, R. (Ed.). (2012). *Health literacy and school-based health education.* Emerald Group Publishing.

Matson, K. L., Orr, K. K., Marino, C., & Cohen, L. B. (2019). The effect of a student pharmacist directed health-education program for elementary-school children. *Innovations in Pharmacy,* **10**(4), Article 4. https://doi.org/10.24926/iip.v10i4.1457

Meadows M. (2006). Outreach program to teach safe medicine use to middle school children. *FDA Consumer Magazine,* **40**(6), 9–10. https://permanent.access.gpo.gov/lps1609/www.fda.gov/fdac/features/2006/606_outreach.html

Merks, P., Cameron, J., Bilmin, K., Świeczkowski, D., Chmielewska-Ignatowicz, T., Harężlak, T., Białoszewska, K., Sola, K. F., Jaguszewski, M. J., & Vaillancourt, R. (2021). Medication adherence and the role of pictograms in medication counselling of chronic patients: A review. *Frontiers in Pharmacology,* **12**, 582200. https://doi.org/10.3389/fphar.2021.582200

Pharmaceutical Services Division. (2022). *Know Your Medicine.* Ministry of Health Malaysia. Retrieved Nov 27, 2023, from https://www.knowyourmedicine.gov.my/

Rungvivatjarus, T., Huang, M. Z., Winckler, B., Chen, S., Fisher, E. S., & Rhee, K. E. (2023). Parental factors affecting pediatric medication management in underserved communities. *Academic Pediatrics,* **23**(1), 155–164. https://doi.org/10.1016/j.acap.2022.09.001

Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., Brand, H., & (HLS-EU) Consortium Health Literacy Project European. (2012). Health literacy and public health: A systematic review and integration of definitions and models. *BMC Public Health*, **12**, 80. https://doi.org/10.1186/1471-2458-12-80

Torres, N. F., Chibi, B., Middleton, L. E., Solomon, V. P., & Mashamba-Thompson, T. P. (2019). Evidence of factors influencing self-medication with antibiotics in low and middle-income countries: A systematic scoping review. *Public Health*, **168**, 92–101. https://doi.org/10.1016/j.puhe.2018.11.018

West, L. M., & Cordina, M. (2019). Educational intervention to enhance adherence to short-term use of antibiotics. *Research in Social & Administrative Pharmacy*, **15**(2), 193–201. https://doi.org/10.1016/j.sapharm.2018.04.011

White, D., & Pitts, M. (1998). Educating young people about drugs: A systematic review. *Addiction (Abingdon, England)*, **93**(10), 1475–1487. https://doi.org/10.1046/j.1360-0443.1998.931014754.x

Wolf, M. S., Davis, T. C., Tilson, H. H., Bass III, P. F., & Parker, R. M. (2006). Misunderstanding of prescription drug warning labels among patients with low literacy. *American Journal of Health-System Pharmacy,* **63**(11), 1048–1055. https://doi.org/10.2146/ajhp050469

World Health Organisation (2007). *Progress in the rational use of medicines.* Retrieved Nov 25, 2023, from https://apps.who.int/gb/ebwha/pdf_files/WHA60/A60_24-en.pdf

Yin, H. S., Dreyer, B. P., van Schaick, L., Foltin, G. L., Dinglas, C., & Mendelsohn, A. L. (2008). Randomized controlled trial of a pictogram-based intervention to reduce liquid medication dosing errors and improve adherence among caregivers of young children. Archives of Pediatrics & Adolescent Medicine, **162**(9), 814–822. https://doi.org/10.1001/archpedi.162.9.814

Zito, J. M., Derivan, A. T., Kratochvil, C. J., Safer, D. J., Fegert, J. M., & Greenhill, L. L. (2008). Off-label psychopharmacologic prescribing for children: History supports close clinical monitoring. *Child and Adolescent Psychiatry And Mental Health*, **2**(1), 24. https://doi.org/10.1186/1753-2000-2-24

Appendix A: Questionnaire pre-post intervention in English

SURVEY (BEFORE & AFTER) KYM PROGRAM 2023

SURVEY OBJECTIVES:

1. To assess the level of school children's knowledge regarding the safe use of medication.
2. To implement interventions in the form of information, education, and games to enhance knowledge about the safe use of medication.
3. To evaluate the effectiveness of interventions by comparing the level of school students' knowledge before and after the intervention.

DEMOGRAPHIC INFORMATION:

1. What is your age?: _____ year
2. What is your gender?: _____ Male _____ Female

KNOWLEDGE	YES	I DO NOT KNOW/ NO
1. All medicines must be registered under the Ministry of Health Malaysia.		
2. The labels on medicines contain the name of the medicine, dosage, and timing.		
3. All medicines should be stored in the refrigerator.		
4. Medicines should not be stored in high-temperature areas.		
5. Unused medicines should be disposed of in the sink.		
6. Certain antibiotics can lead to antibiotic resistance.		
7. Everyone can consume natural health products.		
8. All natural health products are safe to be consumed as they do not cause side effects.		
9. Correct dosage of medicine is essential to ensure its effectiveness.		
10. The medication dosage for children is determined by their body weight.		
11. If you forget to take your medicine, you should take a double dose whenever you remember.		
Total		

Appendix B: Questionnaire pre-post intervention in Malay

SOAL SELIDIK (SEBELUM & SELEPAS) PROGRAM KYM 2023
OBJEKTIF SOAL-SELIDIK:
1. Untuk menilai tahap pengetahuan kanak-kanak sekolah mengenai penggunaan ubat yang selamat.
2. Melaksanakan intervensi dalam bentuk maklumat, pendidikan, dan permainan untuk meningkatkan pengetahuan tentang penggunaan ubat yang selamat.
3. Untuk menilai keberkesanan intervensi dengan membandingkan tahap pengetahuan murid sekolah sebelum dan selepas intervensi..
MAKLUMAT DEMOGRAFI:
1. Berapakah umur anda? : _____ tahun
2. Apakah jantina anda? : _____ Lelaki _____ Perempuan

PENGETAHUAN	YA	TIDAK TAHU / TIDAK
12. Semua ubat hendaklah didaftarkan di bawah Kementerian Kesihatan Malaysia.		
13. Label pada ubat mengandungi nama ubat, dos dan masa.		
14. Semua ubat hendaklah disimpan di dalam peti sejuk.		
15. Ubat tidak boleh disimpan di tempat yang bersuhu tinggi.		
16. Ubat yang belum habis hendaklah dibuang ke dalam sinki.		
17. Antibiotik tertentu boleh menyebabkan rintangan antibiotik.		
18. Semua orang boleh mengambil produk kesihatan berasaskan semulajadi.		
19. Semua produk kesihatan berasaskan semulajadi adalah selamat untuk dimakan kerana ia tidak mendatangkan kesan sampingan.		
20. Dos ubat yang betul adalah penting untuk memastikan keberkesanan ubat tersebut.		
21. Dos ubat untuk kanak-kanak adalah berdasarkan berat badan mereka.		
22. Jika anda terlupa mengambil ubat anda, anda perlu mengambil dua kali ganda dos apabila anda ingat.		
Jumlah		