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ABSTRACT The objectives of this study were to assess the needs of schoolchildren relating to medication safety and to develop and implement a health promotion programme in Qatar. Semi-structured interviews were completed with teachers, nurses and school administrators at 2 primary schools in Doha. Two main themes were identified from these interviews, namely medication basics and medication safety. Subsequently, a 25-minute health promotion programme was developed and delivered to 11 groups of schoolchildren aged 6–10 years. The student groups contained both expatriate and local Qatari students. The programme was evaluated based on perceptions of site representatives, investigators and peer reviewers using a standardized evaluation form. All the evaluators agreed that the programme was beneficial and should be recommended to other schools in Qatar. This study can serve as a prototype for future programmes in the Eastern Mediterranean Region and elsewhere.

Développement, mise en œuvre et évaluation d'un programme de sûreté des médicaments pour les écoliers au Qatar

RÉSUMÉ Les objectifs de la présente étude étaient d'évaluer les besoins des écoliers en matière de sûreté des médicaments et d'élaborer puis de mettre en œuvre un programme de

promotion de la santé au Qatar. Des entretiens semi-structurés ont été menés auprès des enseignants, du personnel infirmier et des administrateurs de deux écoles primaires à Doha. Ces entretiens ont permis de dégager deux thèmes principaux, à savoir les informations de base sur les médicaments et la sûreté des médicaments. Ensuite, un programme de promotion de la santé de 25 minutes a été élaboré puis présenté à 11 groupes d'écoliers âgés de 6 à 10 ans. Les groupes d'écoliers étaient composés à la fois d'expatriés et de Qataris. Le programme a été évalué à partir des points de vue des représentants des établissements scolaires, des chercheurs et des pairs évaluateurs à l'aide d'un formulaire d'évaluation standardisé. Tous les évaluateurs ont reconnu que le programme était bénéfique et devait être recommandé à d'autres écoles au Qatar. La présente étude peut servir de modèle aux futurs programmes dans la Région de la Méditerranée orientale et dans d'autres régions.

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Introduction

Medication safety is a high priority for health-care institutions, governments and international health organizations. The World Health Organization (WHO) states that the majority of adverse drug reactions (ADRs) are preventable, yet, despite this, unintended reactions to medications are among the leading causes of death in many countries (1). This is especially alarming as the use of medication is constantly increasing in countries worldwide (2). Other government bodies, such as the Canadian Institute for Health Research, have listed medication safety initiatives as high priority for funding and research (3).

One vulnerable population that is particularly prone to the harmful effects of medications, vitamins and supplements is children. Children commonly display highly sensitive reactions to medications, including ADRs (4). They are also at greater risk of the harmful effects of medications due to accidental ingestion or unintended overdose (5). Therefore, preventative medication safety initiatives are very important for reducing the harmful effects of medications in children.

Health promotion programmes aim to educate individuals regarding health-related matters in the hope of promoting better health practices. Health promotion targets are broad and include initiatives such as diet and exercise programmes, disease prevention and specialty topics such

as oral health and hygiene (6–8). Programmes targeting medications and medication safety, however, are rare. In fact, we were unable to identify any published reports describing a health promotion programme targeting medication safety in children. With medications accounting for many undesirable and harmful effects (including death) (1), we believe medication safety should be targeted as an important health promotion initiative. Due to the heightened risks of medication use by children, medication safety programmes could be designed to fit the health curricula of primary schools worldwide.

The objectives of this project were to assess the needs of primary-school children relating to medication safety and to develop, implement and evaluate a health promotion programme targeting medication safety principles for schoolchildren in Qatar.

Methods

Study setting

The study was carried out from March to May 2013. Two school sites were selected to participate in this project. To enhance the generalizability of the study to the population in Qatar the schools were selected to have diverse student populations. One school consisted largely of expatriate students from North America and the second school had primarily Qatari nationals with a small proportion of Arab expatriate students. Children aged 6–11 years (grades 1–6) were selected for inclusion. Their primary language of instruction was English with Arabic as a core curriculum component.

Ethical approval for this project was obtained from the institutional review board at Qatar University in Doha, Qatar.

Needs assessment

A needs assessment was first done to develop themes that would be used to develop the programme. Six semi-structured interviews were completed with school staff (1 administrator, 1 teacher and 1 nurse at the first site, and 1 administrator and 2 teachers at the second site). Semi-structured interviews are a flexible way of interviewing which rely on pre-established interview guides but allow for subjects to discuss important considerations that were not identified by the investigators (9). Informed consent was obtained prior to each interview and a predefined script was used as a guide. Interview questions were developed by the investigators and peer-reviewed by an expert in the field. The expert was a pharmacist by training and had extensive experience in qualitative research, development of health promotion programmes and paediatric populations. The interview questions were as follows: “What types of health promotion programmes are offered at your institution?”; “Do you currently have any health promotion activities relating to medications and medication safety offered at your institution?”;

“How would you describe your students’ knowledge regarding medications and medication safety?”; “Do you believe a health promotion programme targeting medications and medication safety would be beneficial for your students?”; “If yes, what concepts do you feel your students would benefit learning from with respect to medications?”

The number of interviews was not pre-defined but instead they were carried out until saturation was reached. Saturation was established when all investigators agreed that no new information or themes were being discussed. Interviews were recorded and transcripts prepared upon completion. Three investigators independently reviewed the interviews and transcripts and identified major themes. All investigators agreed upon the final themes and any disagreement was resolved through discussion.

Health promotion programme

The themes identified were used to develop a health promotion programme regarding medication safety for children. A variety of verbal, visual and interactive activities were used to communicate the core messages of medication basics and medication safety. The programme was developed in English and, while the major content remained similar, presentations were adapted for different age groups and for the different sites. For example, Arabic language was used to clarify points at the school that comprised children whose primary language was Arabic. Each health promotion presentation was designed to be 25 minutes in length.

The health promotion presentations were evaluated by schoolteachers and administrators using an evaluation rubric. Additionally, each presentation was evaluated by 1 peer reviewer (5 reviewers in total) in the final year of study at the College of Pharmacy at Qatar University. Lastly, the investigators reflected on the strengths and weaknesses at the conclusion of each presentation and brainstormed ways to improve and enhance the content for subsequent presentations.

Analysis

Descriptive statistics were used to summarize evaluations from site representatives and peer reviewers. Investigators’ suggestions for improvement were summarized qualitatively.

Results

Themes identified from the needs assessment

After completion of 6 semi-structured interviews (3 from each site), it was determined that saturation had been reached and no further interviews were planned. The major themes

identified from the interviews and the transcripts, namely medication basics and medication safety, are summarized in Table 1 , along with the programme's objectives and major activities.

Evaluation of the health promotion programme

The health promotion presentation that was subsequently designed—entitled "Medications and you"—was delivered to 11 groups of schoolchildren aged 6–11 at the 2 school sites. An evaluation was obtained from a school representative (teacher or administrator) at the completion of each presentation. A summary of the evaluations is presented in Table 2 . Overall, the programme was received positively with 100% of evaluators agreeing or strongly agreeing that the programme should be available for other schools in Qatar. Positive qualitative comments described the programme as "very worthwhile and informative", "novel and important" and "effective through a variety of teaching methods". Suggestions for improvement included more practice to increase the confidence of presenters; clearer communication for native-English students; and modification of interactive activities to be more suitable for older students.

Peer evaluations were also positive with all of the reviewers agreeing or strongly agreeing with every category on the rubric presented in Table 2 . Suggestions for improvement obtained from the peer reviewers included incorporating more interactive activities; louder and clearer communication from presenters; and greater efforts to keep the younger children focused.

Discussion

To our knowledge, this is the first published report of a medication safety health promotion programme for primary-school students in the Eastern Mediterranean Region and possibly worldwide. With the increasing use of medications to treat both acute and chronic diseases, education is needed to ensure children avoid both preventable and incidental harmful effects of medications. This programme may serve as a platform for future programmes aiming to accomplish similar objectives through promotion of safe medication practices.

Raising awareness of medication safety with children may have many beneficial effects. Throughout the presentations, we found that the children had common misconceptions about medications, especially when trying to distinguish between medications and candy. With the pharmaceutical industry developing novel dosage forms for medications and supplements (gummies, dissolvable flakes, flavoured chewables), it is important for children to be educated regarding the similarities between medications and candy in order to avoid harmful effects from incidental exposure. Additionally, it is important for children to recognize trustworthy adults to ask for advice regarding medications as well as for them to know from whom they should receive medications. As with other health promotion initiatives, the children may further

disseminate the information through discussions with parents, relatives, and friends.

This project allowed us to identify a target population for widespread roll-out of this programme. It was found that children aged 7–9 years were the most interactive, demonstrated the value of learning, and were more familiar with the activities and videos chosen for the presentations. Future presentation will be tailored to this population, considering all types of teaching methods. Additionally, it was found that adapting the programme based on language, culture and religion was positively received and this will be encouraged for future sites.

While this project provides a platform for a health promotion programme regarding medication safety to children, some limitations should be discussed. Firstly, the programme was piloted in only 2 sites in one country. This limitation was recognized and we attempted to overcome it by selecting sites with diverse populations and inclusion of children with varying ages. Secondly, it was not possible to assess changes in children's knowledge after the presentations and it is not known if any change would be sustainable. If this programme or similar programmes were implemented on a wider municipal or national level, researchers should be encouraged to assess hard outcomes, such as incidence of adverse drug reactions and/or hospital or doctor visits. Thirdly, parents were not involved, and learning may be enhanced by providing information resources to parents for reinforcement at home. Finally, the age range of the students was not homogenous (6–10 years) but, as discussed, this was a pilot study to determine the most appropriate age range for this type of intervention.

Despite the limitations mentioned above, this project serves as a novel prototype for teaching medication safety principles to children. The methods are adaptable to most populations and can be replicated to fit the needs of many regions. As such, the results from this project may be used to further develop health promotion regarding medication safety. Future research should attempt to refine health promotion initiatives and assess sustainable effects, in order to ensure the best possible outcomes are being achieved.

Competing interests: None declared.

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