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Original Article

Evaluation of a health-promoting school program to enhance correct medication use in Taiwan



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ARTICLE INFO

Article history:

Received 6 May 2013

Received in revised form

19 August 2013

Accepted 20 August 2013

Available online 4 October 2013

Keywords:

Health Promoting School

Medication

ABSTRACT

This study was an evaluation of the Health Promoting School (HPS) program in Taiwan and its effectiveness in enhancing students' knowledge and abilities with regard to correct medication usage. In 2011, baseline and follow-up self-administered online surveys were received from 3520 middle-school and primary students from intervention schools, and 3738 students from comparison primary and secondary schools completed the same survey. The results indicated that after implementing the correct medication use HPS program, students' knowledge and abilities concerning correct medication usage (i.e., the need to express clearly personal conditions to physicians, to check information on the medication packages, to take medication correctly and adhere to prescribed medication regimens, not to buy or acquire medication from unlicensed sources, and to consult pharmacists/physicians) were significantly increased among the students in the intervention schools ($p < 0.001$). In addition, students' knowledge and abilities concerning correct medication usage were significantly higher in the intervention schools compared with the comparison schools ($p < 0.001$). In conclusion, the correct medication use HPS program significantly enhanced students' knowledge and abilities concerning correct medication usage.

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<http://dx.doi.org/10.1016/j.jfda.2013.09.013>

1. Introduction

The World Health Organization (WHO) emphasizes that unintended, harmful reactions to medication are among the leading causes of death in many countries [1]. In addition, several problems have been identified with children and adolescents and their use of medication – unlicensed drugs,

counterfeit drugs, herbal medications that are not evidence-based, drugs from illicit street vendors, and the abuse of non-medical prescription drugs [2–4]. In the USA, about 10% of adolescents have reported the use of non-prescription pain relievers [5]. In Taiwan, 10% of adolescents have reported buying non-prescription pain relievers during the past year [6].

In 1995, Taiwan initiated a National Health Insurance program, which amounts to universal health insurance. Taiwan residents can access comprehensive treatments and obtain many drugs from different health sectors. Pharmaceuticals accounted for 24% of the total National Health expenditure in Taiwan in 2011 [7]. The average yearly number of outpatient visits in Taiwan (15.2 visits) was more than twice that (6.3 visits) in countries associated with the Organization for Economic Co-operation and Development (OECD) [8]. In Taiwan, some people engaged in “doctor-shopping” behavior that was more likely to result in duplicate medications that caused adverse drug reactions. A study in Taiwan showed associations between the duration of polypharmaceutical use and acute renal failure [9].

In Taiwan, problems have been documented concerning the use of medications: a lack of knowledge, attitudes, and practices regarding the safe use of medications [10]; co-medication that mixes conventional medication with non-prescribed Chinese herbal medication [11]; failure to comply with prescribed antibiotic regimens [12]; and purchasing medication from underground radio stations, street vendors, and tour buses. Studies have associated the use of non-prescribed Chinese herbal medication with chronic kidney disease [13] and end-stage renal disease [14].

During the past decade, the Taiwan government has trained pharmacists to teach people at community universities about safe medication use and found that enhancing participants’ medication knowledge can have a positive effect [15]. To expand safe medication use education to children and adolescents, the correct medication use HPS program was launched in 2009 by the Taiwan Food and Drug Administration in cooperation with the Taiwan Ministry of Education and Taiwan Pharmacist Association. Local schools and hospitals received a grant to work together to enhance teachers’ capacities to implement correct medication use education that enhances teacher and student competencies with regard to correct medication usage. The number of schools joining in the correct medication use HPS program increased from 51 schools in eight counties/cities in 2009 to 86 schools in 14 counties/cities in 2011, whereas the number of hospitals joining the correct medication use resource center program increased from 10 hospitals in eight counties/cities in 2009 to 18 hospitals in 15 counties/cities in 2011.

Promoting the health of children through schools has been an important goal of the WHO since 1950 [16]. The Health Promoting Schools (HPS) concept was based on the Ottawa Charter presented at the first international conference on health promotion in 1986 [17]. The WHO advocated HPS as an effective approach to promote the well-being of both school children and staff. The HPS concept was introduced in Taiwan in 2000. To facilitate adoption of the HPS program by schools, the Taiwan Ministry of Education funded local education authorities and universities to build HPS support networks to enhance teachers’ capacities to implement HPS programs.

HPS themes that were implemented included healthy weight, oral health, vision health, sex education, smoking prevention, and correct medication use.

Some studies have indicated that the implementation of the HPS program has had a positive impact on students’ health behaviors [18,19], on self-reports of health conditions [20], and on various domains of health for the school community [21]. However, no study has yet examined the effects of implementing correct medication use through the HPS program. This is the first attempt by the Taiwan government to develop materials that can be used to educate school-aged children about correct medication use in combination with HPS strategies. The aim of this study was to examine the effects of implementing the correct medication use portion of the HPS program in Taiwan. The hypothesis was that the implementation of a correct medication use program should have a positive effect by increasing students’ knowledge and abilities concerning correct medication usage.

In 2011, the correct medication use HPS program was implemented in 14 counties/cities in Taiwan. The program featured a collaborative partnership between schools, local education authorities, hospital/community pharmacists, and university support networks. At the national level, the Taiwan Food and Drug Administration cooperated with the Taiwan Ministry of Education, the Taiwan Pharmacist Association, and the Taiwan HPS support network to provide financial and expert resources to schools. At the local level, the city/county Education Bureau collaborated with the Health Bureau, the city/county pharmacist association, hospital correct medication use resource centers, and the city/county correct medication use school center to assist primary and secondary schools in adopting and implementing a correct medication use program. In addition, the city/county correct medication use school center cooperated with the pharmacist association and hospitals to provide teachers with training and to conduct city/county campaigns such as the correct medication use contest and the one school one pharmacist campaign. At the school level, schools invited hospital/community pharmacists and experts from the Taiwan HPS support network to build teacher capacity and to assist in the implementation of the correct medication use HPS program. More than 100 experts from different universities and hospitals were invited to participate in the correct medication HPS program support network in order to provide technical support for city/county officers and local schools.

To enhance teachers’ and students’ medication literacy, the core abilities of correct medication usage were developed [22]. The core abilities of correct medication usage were designed to be a national educational resource for schools and community groups in teaching students and families about correct medication use. The core abilities included the following five points: (1) Ability I, the ability to express clearly personal conditions to your physicians; (2) Ability II, the ability to check information on the medication packages; (3) Ability III, the ability to correctly take medications as prescribed; (4) Ability IV, the ability to be your own master in taking medications; and (5) Ability V, the ability to be in touch with your pharmacists and physicians. Teachers and pharmacists developed different kinds of teaching materials and activities based on the correct medication usage core abilities. Several

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