

Prevalence of Pediatric Adherence Level to Asthma Medications

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Abstract

Objective: To assess adherence to asthma medications among paediatric population in Saudi Arabia, correlate poor adherence with the level of asthma control and investigate the factors that may influence the patient's adherence.

Methods: This Cross-sectional study will include 319 paediatric participants, they will be recruit from two paediatric asthma clinics at King Abdullah Medical City (KAMC) and Maternity and Children Hospitalin Makkah (MCHM) by using a valid Arabic translation of the 8-item Morisky medication adherence scale (MMAS-8).

Results: The adherence rate among children by MMAS-8 identified in 35.1 % were low adherence rate, while medium adherence were 64.9%.The adherence rate significantly increased with the parent's educational level among mothers (P-Value = <0.001) while the fathers is (P-Value = 0.004). Moreover, the prevalence of parents concern about asthmatic medication side effects of long-term usage are 56.7% while 43.3% of parents are not.

Conclusion: The studies in Saudi Arabia showed high prevalence of asthma among children and a high rate of poor asthma control, yet no studies was conducted to assess the rate of pediatric adherence to asthma medication also the burden of the problem of "non-adherence" among asthmatic children in terms of medical complications, educational problems and health-care cost. In general, studies showing the benefits of strict adherence to asthma medication, in form of better control of asthma symptoms as well as decrease in asthma morbidity and mortality.

Introduction

Asthma is one of the most common childhood chronic diseases, approximately about 300 million individuals are affected worldwide and the prevalence is increasing especially among children [1]. In Saudi Arabia, the prevalence of asthma among schoolchildren ranges from 12% to 24% [2-4]. Asthma can be managed effectively [1]. Nevertheless, a successful management requires a mutual participation between the health care provider and the patient. Effective medication will not work without the patient's adherence to those medications. In asthma, adherence to the medications is the cornerstone in achieving the optimal asthma control. Several studies have reported a low rate of adherence to asthma medications among children, the rate of adherence ranged from 50% to 70% [5-7]. In the middle-east, a study in Egypt reported a 38.4% non-adherence with asthma prophylactic management among asthmatic children [8]. Poor adherence to the prescribed medications is a major concern in asthmatic patients. It may compromise the treatment regimen, and results in poor asthma control [9]. Poor adherence had been strongly associated with an increase in asthma-related morbidity and mortality and an increased number of emergency visits and hospital admissions [10-12]. Poor adherence is a multifaceted problem, the impact of poor adherence is not confine to the medical aspect alone, but it has social and economic dimensions too, likewise school absenteeism, which is one of the important consequences of poor adherence and poor asthma control, which in turn, if happened repeatedly may influence the child school performance [13,14]. Moreover, poor adherence results a high health-care cost, the annual estimated cost of non-adherence in United States was about 300 billion US dollars [15]. The problem of poor adherence can be attribute to many different factors [16-18]. These factors could be related to the medications, as the long treatment regimen, the complexity of the delivery device, the side effects and the cost of the treatment, or could be related to the child's parents as the level of education, knowledge about asthma, parent's

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beliefs toward the medications and their concerns about the long term use of the medications [16]. In addition, Poor communication between the health-care provider and the patient, and the lack of a thorough discussion about the appropriate way to use the medication "e.g. inhalers" and the importance of adherence even with absence of symptoms has a huge impact on patient's adherence. It is essential that Physicians and health care providers acknowledge and accept the responsibility for patient compliance and should give their attention to any indication of poor adherence, as worsening of asthma symptoms despite having an adequate treatment or recurrent hospitalizations. Goes hand in hand, detecting poor adherence early allow the physician to intervene early and avoid the unnecessary change in the medications or increasing the doses [6]. This study aims to assess adherence to asthma medications among pediatric population in Saudi Arabia, correlate poor adherence with the level of asthma control and investigate the factors that may influence the patient's adherence.

Methodology

Participants

This cross-sectional study will include 319 pediatric participants. They will be recruit from two pediatric asthma clinics at KAMC and MCHM. Pediatric patients who met the inclusion criteria will be enroll in the study:

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1. Physician - diagnosis of asthma at least 6 months prior to participation.
2. Using one or more of asthma medications for at least 2 months prior to participation
3. The parents "mother or father" are willing to participate and sign the informed consent.

No restriction on the age, gender, nationality, residence city, or socioeconomic status.

The Questionnaire

We used a structured questionnaire includes patient's socio-demographic data. A Valid Arabic translation of the 8-item Morisky medication Adherence Scale (MMAS-8). These eight questions assessing the child's adherence to asthma medication.

Morisky Medication Adherence Scale (8-item)

1. The scale measures the adherence on an 8-point scale. "Factors related to poor medication adherence "such as parents' education level, worker mother, parent's concern about long term medication use, and side effects of the medications, stopping the medications when the child feels better or worse, child's behavior toward taking the medication, treatment cost, the physician-patient relationship".
2. The Morisky medication Adherence Scale (MMAS-8) Questionnaire include: 7 questions have Yes\No answer, and as the patients tend to answer yes when asked questions, the question worded in a way that the answer yes identifies a non-adherence behavior, to avoid the "saying-yes" bias [19,20]. While the last question has a 5-point Likert response.
3. Subjects with <6 were considered to be Low Adherence, while subjects with 6 to <8 were considered to be medium Adherence, although subjects with =8 were considered to be high adherence.
4. The translation obtained from the author "Morisky D.E". The translation process consisted of two teams of native linguistic experts who independently conduct forward and backward translation of the scale. The author reviewed the backward translations from both teams, assess the linguistic, and construct validity of each item of the scale.

Statistical analysis

Data was entered, coded, cleaned, and analysed using the statistical package for social science version 22 (IBM SPSS, Chicago, IL, USA). Assuming that the data followed normal distribution and excluding some continuous variable outliers, we performed statistical analysis to test the significance of differences in severity of asthma among asthma patients who were or were not adhere to the treatment. In addition, simple descriptive statistics are reported as proportions for qualitative variables such as frequencies and percentages of severity of asthma among patients who were or were not adhere to the treatment. standard deviation. The results were considered significant when P-values were <0.05.

Results

Our study group consisted of total 319 patients 144 male (45.1%) and 175 female (54.9%), with a mean age of 6.34 ± 7.35 years most of

patients School level is Elementary School 193 (60.5%) while patients School level is Pre School were 97 (30.4%) and patients School level is Kindergarten were 29 (9%). Moreover most of our study reviled that Responsibility of drug intake is the mother 209 (65.5%) then after is the child 98 (30.7). although, most of our study reviled that most of mothers are not working 241 (75.5%). Table 1 shows that our study is indicative of prevalence of adherence rate among children by MMAS-8, which identified in 35.1 % (112) among participants were low adherence rate, while the medium adherence were 64.9% (207) of participants. Figure 2 shows that in total of 207 participants with Medium Adherence to Treatment among Education Level of Parents which reviled that the adherence rate significantly increased with the educational level specially among mothers (P-Value = <0.001) while the fathers is (P-Value = 0.004). Although, the adherence rate among educational level of collage among mother is (165) 79.7% while fathers is (115) 55.6%. Otherwise, the adherence rate among educational level of high school among mothers is (40)19.3%, while fathers is (46) 22.2% however, the adherence rate among educational level of Middle school among mothers are (2) 1% while among fathers is (6) 2.9%. Moreover, Figure 3 shows that in total of 112 of participants with Medium Adherence to Treatment among Education Level of Parents which reviled that the adherence rate among educational level of collage among mother is (80)79.7% while fathers is (35) 31.2%. Otherwise, the adherence rate among educational level of high school among mothers is (23)20.5%, while fathers is (24) 21.4% however, the adherence rate among educational level of Middle school among mothers are (9) 8% while among fathers is (13) 11.6%. However, Figure 4 shows prevalence of parents concern about asthmatic medication Side Effects of long-term usage, which reviled (56.7%) 181 of them concern about that while 138 of parents (43.3%) are not.

	Number	Percent
Gender		
Male	144	45.1%
Female	175	54.9%
School level		
Elementary School	193	60.5%
Kindergarten	29	9%
Pre School	97	30.4%
Responsibility of drug intake		
Mother	209	65.5%
Father	9	2.8%
Sister	3	0.9%
Child	98	30.7%
Mother Work		
Yes	78	24.5%
No	241	75.5%

Table 1: Shows the prevalence of Gender, school level, the responsibility of drug intake and is the mother work or not.

Discussion

In Saudi Arabia, the prevalence of asthma among schoolchildren ranges from 12% to 24%, In addition, there is enough evidence to suggest that the prevalence of the disease is increasing. Consequently, rates of morbidity and mortality due to bronchial asthma continue to increase [2-4,13]. However, not many studies had done in the

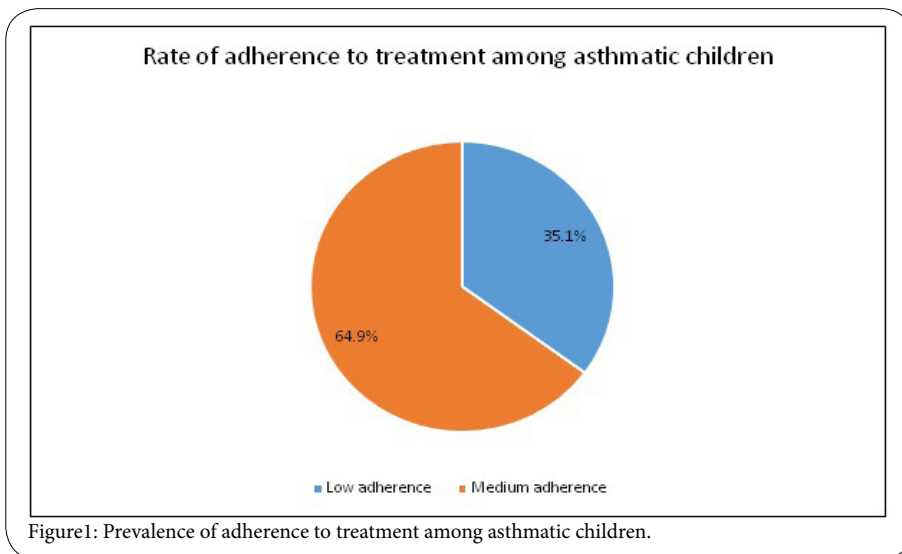


Figure1: Prevalence of adherence to treatment among asthmatic children.

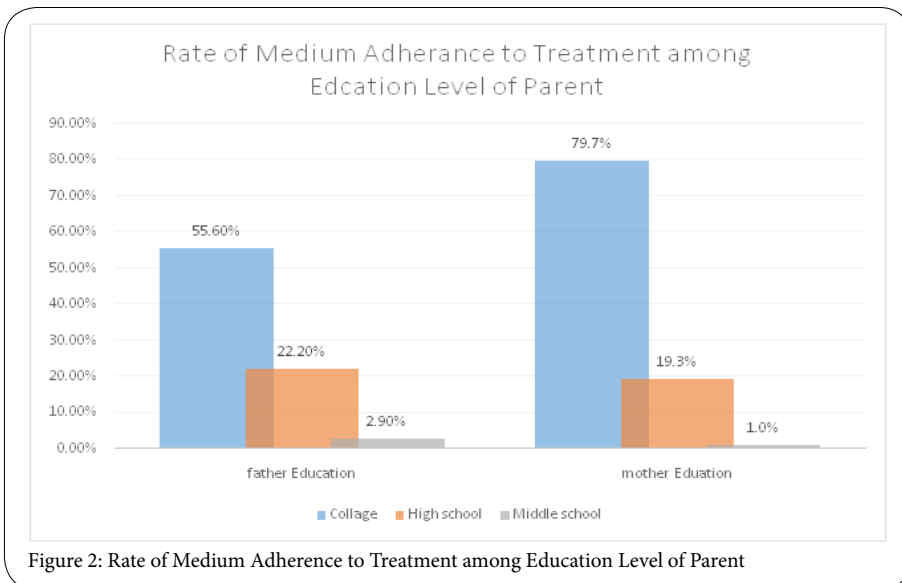


Figure 2: Rate of Medium Adherence to Treatment among Education Level of Parent

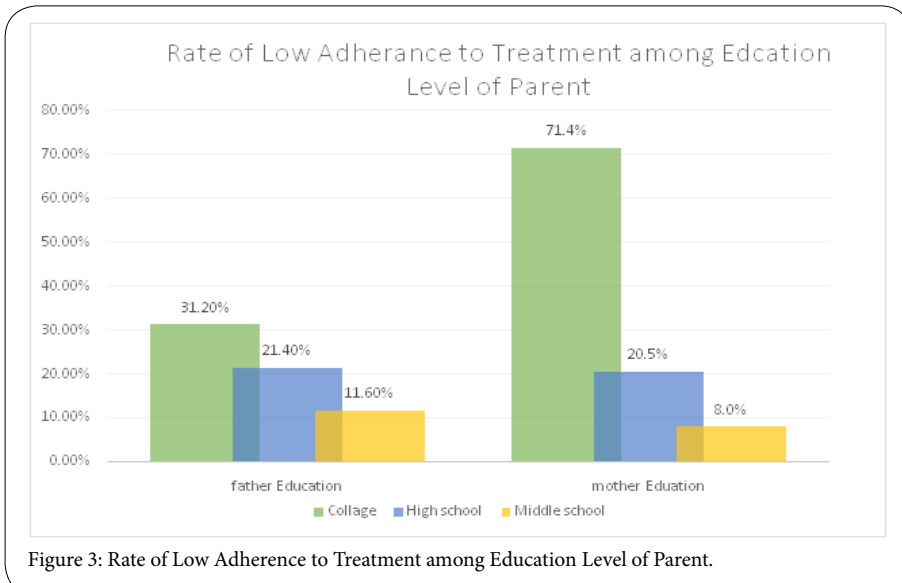


Figure 3: Rate of Low Adherence to Treatment among Education Level of Parent.

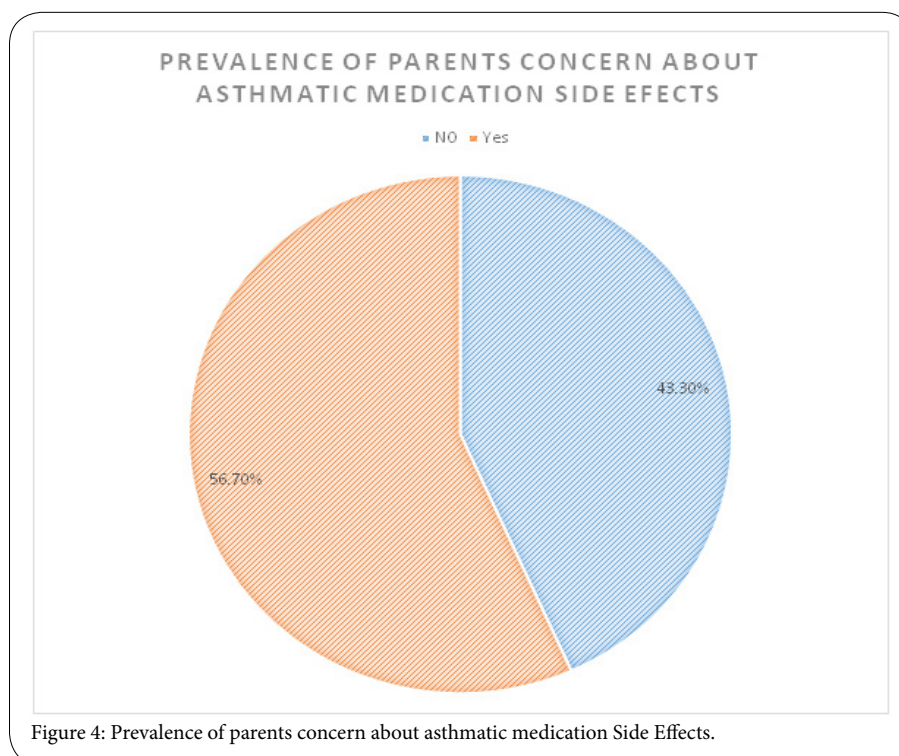


Figure 4: Prevalence of parents concern about asthmatic medication Side Effects.

Middle East "particularly Saudi Arabia" in the field of medication adherence among children with asthma [19]. In a study carried out among 27 children with mild to moderate asthma to measure the children asthma medication adherence using different methods "self-report, mother-report, canister weight and an electronic Doser". The adherence rate was 80% by self and mother report, 69% by canister weight and about 50% by the electronic Doser [5]. Moreover, A strong association had been revealed between non-adherence to asthma medication and increased asthma morbidity "such as wheezing, slow activity, sleep disturbance, school missing, hospitalization" among 1528 children with asthma and their caregivers in United States. The study showed that non-adherence is related to increased subsequent asthma morbidity regardless to the severity of asthma [20]. However, in another study used also deferent methods one of them are patient survey "including 4-item MMAS and among 372 asthmatic patients aged 6-64 years, they found "20.7%" of the patients was adherent by MMAS [21] one of common parries of adherent to asthma medication is the parents concern about its side effects and the caregiver education level as shown in our study results 56.70% of parents concern about the side effect of long term usage of asthma medication and the prevalence of low and medium adherence among the parents there education level is middle school is the lowest comparing to parents there education level is collage so, Parents play a major role, if not the essential role, in the child's adherence to the prescribed medications. Several studies endorse the correlation between parents' beliefs and concerns about the treatment, and the parent's level of education with the medication adherence [22-24]. A cross-sectional survey reported 622 parents of children with asthma in Southeast Michigan was conduct to assess the impact of positive and negative parent's beliefs on adherence, showed that 72% of the parents felt that their child's asthma medications were necessary which associated with higher (better) rate of adherence scores [22]. Beside, similar conclusion had shown in a study among 67 children and their parents, where 75% of the parents strongly believed that their child's medications were

necessary for their health while 34% had a strong concern about the medications. they concluded that parental concerns about controller medications were associated with poor adherence [23]. There is a significant association between the adherence rate and the education of the patients and their parents about the planned treatment regimen. A semi-experimental (before-after) study was conducted to examine the impact of education plan and follow up on 200 asthmatic children who were treated at least one year "between Feb. 2004-Feb. 2006" by the conventional method, and 300 asthmatic children with the same age and disease severity treated at least one year "between Feb. 2006-Feb. 2008" by a comprehensive plan of education and regular follow up. The findings showed significant change in the adherence rate from 50% before the intervention to 84. 3% after the intervention (the education and the scheduled follow up). These findings indicate that education and follow up can results in higher degree of adherence [25].

Conclusion

The studies in Saudi Arabia showed high prevalence of asthma among children and a high rate of poor asthma control, yet no studies was conduct to assess the rate of pediatric adherence to asthma medication, which considers an important factor behind poor asthma control. Recognizing the major contributions of adherence in the effectiveness of asthma management, also the burden of the problem of non-adherence among asthmatic children in terms of medical complications, educational problems and health-care cost, although the lack of studies in Saudi Arabia in particular and middle east in general. Routine screening for bronchial asthma risk factors among children, promotes the education about risk factors of bronchial asthma as well as the morbidity of poor adherence and the benefits of strict adherence to asthma medication, may improve the adherence rates to asthma medication as well as the severity of asthma.

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Conflict of Interest

The authors declare no competing interest.

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