ASTHMA AND PHYSICAL ACTIVITY:

Assessment of Maternal Attitudes and Beliefs towards Physical Activity of Asthmatic Children in Yerevan, Armenia

An analytical cross-sectional study

Master of Public Health Integrating Experience Project

Utilizing Professional Publication Framework

by

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LIST OF ABBREVIATIONS

BMI - Body mass index

BR - Bronchial responsiveness

EIA - Exercise Induced Asthma

EPR - Expert Panel Report

GINA - Global Initiative for Asthma

IRB - Institutional Review Board

ISAAC - International Study of Asthma and Allergies in Childhood

MLR - Multiple linear regression

MOH - Ministry of Health

MPH - Master of Public Health

NAEPP - National Asthma Education and Prevention Program

Ph/a - Physical activity

SLR - Simple linear regression

SES - Socioeconomic status

VIF - Variance inflation factor

WHO - World Health Organization

ABSTRACT

Literature review/background information. Consistently, studies conducted worldwide have found that regular physical activity for children with chronic asthma is beneficial. In spite of international guidelines for managing childhood asthma recommending equal participation with healthy children in physical activities, physical activity is still believed to be detrimental for asthmatic children—in addition, asthma is believed by parents, children and sometimes physicians as a barrier to exercise. The aim of this research is to study the associations between maternal beliefs and attitudes towards the child's physical activity and the level of physical activity of the asthmatic child in Yerevan, Armenia.

Methods. The study design was an analytical cross-sectional survey with some abstractions from medical records. The research proposal was reviewed and approved by the Institutional Review Board of American University of Armenia. The study population was mothers of children aged 6-14 years who have been diagnosed with asthma and were attending "Arabkir" Medical Center. Participants were reached by telephone. The study conducted a census of eligible mothers, thus the power of the study (0.86) was calculated afterwards considering a significance level of 0.05 and sample size of 121. Basic descriptive statistics were used for describing demographic characteristics. Simple and multiple regression analysis were performed to test relational hypotheses: the associations between the main variables, while controlling for potential confounding and interactions.

Results and discussion. The majority of surveyed children were boys (86%). Roughly half of the participants (52%) were from Yerevan, 33% from other cities of Armenia, and 15% from villages. Of mothers, 69% supposed physical activity as a possible trigger for asthma attack, 51% thought that asthma symptoms can get worse because of exercising, and 47% considered that children with asthma should avoid exercising. Majority of mothers (84%) reported that their child's physical activities were limited; including 60% of participants reported very limited activity levels for their children. The association between maternal beliefs and physical activity limitation was found to be statistically significant (p-value much less than 0.05). After adjusting for severity of asthma, mother's beliefs and attitudes score showed an *independent* association with the asthmatic child's level of physical activity—indicating that health education and promotion interventions that change mothers' misbeliefs and unfavorable attitudes towards physical activity for their asthmatic child may promote an increase in physical activity level of these children thus benefiting them.

Conclusion and recommendations. The current study found that some mothers restrict physical activities of their asthmatic child based on misbeliefs and detrimental attitudes towards physical activity and its relationship with asthma, *independent* of the severity of asthma. Based on these findings and the published literature, it is recommended that awareness among mothers and some physicians should be raised about the beneficial effects of physical activities for asthmatic children, leading to the reduction in restrictions on the activities of these children, with prescription of appropriate physical activity program for children with asthma to achieve better asthma control.

LITERATURE REVIEW/BACKGROUND INFORMATION

There are many definitions of asthma. By World Health Organization (WHO) it is "a chronic disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person" (1). The third expert panel report (EPR-3) of the National Asthma Education and Prevention Program defines asthma as a common chronic inflammatory disease of the airways that involves a complex interaction of airflow obstruction, bronchial sensitivity and an underlying inflammation (2). It is a challenging condition which can affect physical, psychological and social domains of quality of life (missing work- or school-days, restriction to participate in sports, fear of asthma attack, embarrassing about taking medication publicly, feeling differently, and so on).

It is a serious Public Health problem. According to WHO estimates, 300 million people in the world suffer from asthma and 255,000 people died of asthma in 2005 (1).

Asthma has become more common in children and adults worldwide in recent years (3). Also during the last few decades it has become the most widespread chronic disease among children and one of the major causes of hospitalization among those younger than 15 years of age (4). Asthma like other chronic diseases may have major impact on the quality of life of the patients and their families (5;6).

The fact that asthma can be controlled is scientifically proved, and asthma managing and treating guidelines are helpful for coping asthma properly (1;7-9). In the guidelines from the National Asthma Education and Prevention Program (NAEPP) and the Global Initiative for Asthma (GINA) it was stated that person with diagnosed asthma should: "Prevent chronic and troublesome symptoms", "Maintain (near) ''normal'' pulmonary function" , "Maintain normal activity levels (including exercise and other physical activities)" and other goals (10).

Physical activity is defined as “any bodily movement produced by skeletal muscles that require energy expenditure” (11). Physical activity is very important for children's overall physical, emotional and social health and wellbeing (12). Many studies conducted worldwide have also found that regular physical activity for children with chronic diseases including asthma benefits those children (13-18). In a prospective cohort study, children without asthma with an average age of 9.7 years were followed for 10.5 years (19). The authors concluded that children with low physical fitness are at a higher risk for development of asthma as compared to children with high physical fitness. There is scientific evidence that “an increased level of bronchial responsiveness (the abnormal responds of airways) was present in children with current asthma with the lowest level of physical activity”(20). A positive association was revealed between poorly controlled asthma and reduced physical activity (21).

No one study has been found showing any harmful effect of physical activity on asthma condition. Literature confirms that if exercising or being active worsens asthma symptoms it implies that child’s asthma is not properly controlled (10;22). This refers to Exercise-Induced Asthma (EIA) as well. Often exercise-related shortness of breath is wrongly diagnosed with EIA (15;23;24). According to modern asthma management guidelines, even the patients correctly diagnosed with EIA should not restrict their physical activities, because exercise-induced bronchoconstriction (narrowing of the airways that occurs in an asthma attack) is also an indication that the patient’s asthma is not well controlled (2;8).

In spite of asthma treatment guidelines’ recommendations of equal participation in physical activities with healthy children, asthma symptoms still are thought to prevent asthmatic children from participating in some forms of physical activity, and asthma is identified by parents, children and sometimes by health care professionals as a barrier to exercise (25). The published literature shows that asthmatic children engage in less physical activity than

children without asthma (24;26;27). However, some studies do not support the hypothesis that asthma symptoms induce a lower physical activity level (28-30).

There are many explanations why asthmatic children limit their physical activity, including biological, psychological and social considerations (31). One of the possible reasons for that may be related to the beliefs of parents that physical activity is detrimental to their asthmatic child's health (24;25). The attitude towards physical activity is an important motivating factor for participation. Famous psychologist Bandura from the late 1970s has explored the role that self-efficacy beliefs play in human functioning (32). Parents take an active role to assist their child's involvement in physical activity (33-35). So, parents' beliefs and attitudes toward managing asthma in general, and complying with treatment guidelines might play a key role in child's future behavior.

Severity and controlled asthma

In order to assess asthmatic patients' condition, it is essential to operate with clear definition of asthma severity (36). So far, many definitions were developed, but "none are consistently used, especially within cross-sectional research" (6). Often the terms of asthma severity and control are used interchangeably (10). Severity is defined as the "intrinsic intensity of the disease process" and refers to pathological disease status, whereas asthma control is the "degree to which the manifestations of asthma (symptoms, functional impairment, and risks of untoward events) are minimized and the goals of therapy are achieved" (10;37).

Situation in Armenia

While asthma is a global public health problem, there is no up to date information concerning the prevalence of asthma in Armenia, and existing data are somehow contradictory to each other.

By the estimation of Ministry of Health (MOH) in 2002, the prevalence of asthma among children up to 14 years old is 10-12 %, and mortality rate from asthma among 5-34 years old people is 0.3 per 100,000 (38). Andranik Voskanyan, the head therapeutist-pulmonologist of Armenia, stated that the disease-specific mortality rate for asthmatics was 4 out of 100 000 people before 1998-99, and with improvements in treatment and implication of new medicines for coping with asthma attacks, the mortality rate decreased four times (39). "The number of asthmatics in Armenia comprises 5-7%, similar to any country in our climatic zone" – said Voskanyan A. at November 27 news conference in 2009 (39).

According to WHO country health statistics 2004, based on Comparative Risk Assessment, the prevalence of asthma in Armenia comprises 0.8/1000, whilst world's lowest country rate was 0.3/1000 and the highest country rate was 2.8/1000 (40).

Aim of the study:

The aim of the research project is to study the associations between maternal beliefs and attitudes towards physical activity and the level of physical activity of the asthmatic child.

The research questions are:

- What are maternal beliefs and attitudes towards physical activity of asthmatic children?
- Is there an association between mothers' beliefs and attitudes towards physical activity of asthmatic children and the level of physical activity of their children with asthma while controlling for severity of their asthma?

METHODS

Study Framework

Professional Publication Framework was chosen.

Study Design

The study design is an analytical cross-sectional, which is sufficiently efficient and feasible to answer the research questions. It is a cross-sectional study, as it is a snap-shot view, and analytical as the associations between study variables have been explored.

Target population – mothers of children aged 6-14 years who have been diagnosed with asthma by a physician.

Study population – mothers of children aged 6-14 years who have been diagnosed with asthma and are attending "Arabkir" Medical Center, and who do not meet the following exclusion criteria:

- having major physical disability or other chronic diseases among asthmatic children,
- not speaking fluent Armenian among mothers.

As the study is a census of eligible mothers, the power of the study was calculated afterwards considering a significance level of 0.05 and the actual sample size of 121. Assumptions were based on literature review and the results obtained in the current study. In a case-control study conducted in the United Kingdom, 60.7% of the parents in the asthma group reported the child's asthma as a barrier to physical activity (25). So, the estimated power for this study was 0.86, taking into account that 47.1% of mothers in this study reported that children with asthma should avoid exercising.

Data collection

Enrollment and data collection for the research project was performed during a wide range of days of the week and times of the day during March and April 2011. The data were collected by one investigator. Eligible mothers were reached by telephone.

Participants were selected from the Allergy and Immunology Department of "Arabkir" Medical Center, the only department in the Republic, where official data exist regarding children with bronchial asthma from the entire country. This might bring diversity to the selected participants in terms of residency and socio-economic status of the families.

Study Instrument

Study Instrument was developed by the student investigator using selected items from several validated instruments (41-43). The Instrument includes 37 items [Appendices 1, 2]. The main domains of the questionnaire are:

- physical activity-related knowledge and attitudes of a mother,
- limitation of child's physical activity,
- severity of asthma,
- demographic information.

The instrument does not contain sensitive questions.

The instrument was first developed in English [Appendix 2] and then translated into Armenian [Appendix 1]. Later it was pretested, after which some corrections were made. The questionnaire was applied in Armenian and took approximately 10-15 minutes to complete. Questions were asked to participants by phone, and answers were recorded.

A Patient Information Form [Appendix 3], used for identification and contacting study participants, included child's name, home and/or mother's telephone numbers, residence, child's date of birth, height and weight (BMI was calculated afterwards), severity of asthma taken from the records, date of contact, and, finally, the result of the interview.

Analysis

The collected data was entered into an electronic data base. For this purpose, SPSS 11.0 statistical software for Windows was used. Cleaning procedure was performed to assure the accuracy of the entered data. During the analysis, the data from SPSS was transferred into STATA 7, because the student investigator used both Statistical Packages.

Basic descriptive statistics were used for describing demographic characteristics. Regression analyses are useful to test relational hypotheses. Simple and Multiple Linear Regression were performed to test the associations between the main variables, while controlling for potential confounding and interactions.

Study Variables:

Numerical scores were calculated for certain items' responses, allowing them to be analyzed as continuous variables.

The dependent variables of the study are child's level of physical activity and severity of his/her asthma. The way of measuring these variables is described below:

- To measure asthmatic child's limitation in physical activities, mothers were asked to rate a range of their child's physical activities, such as running upstairs or uphill, riding a bike, dancing, climbing, tumbling, jumping, playing with other children etc, on a 3-point scale – "none", "a little" or "a lot". Then item scores were summed to

form a total score for physical activity limitation with higher scores indicating less limitation, or greater activity. The resulted continuous variable ranged from 11 to 22.

- Asthma severity, or controlling status, was rated according to the published guidelines (2;6). In this study, we used a severity score based on symptom frequency (number of attacks of wheezing and/or coughing during the daytime and nights in the last month). The range of this score was 3 to 11 with higher scores indicating more severe asthma.
- Physician-assessed severity of child's asthma was obtained from the records. This is an ordinal variable (mild, mild/moderate, moderate, moderate/severe, and severe).

The independent and intervening variables were as follows.

Some items in the questionnaire were responsible for assessment of maternal beliefs and attitudes toward physical activity of asthmatic child, e.g.: "Physical activity is beneficial for health of a child with asthma", or statement that physical activity as a trigger can cause an asthma attack. Computed scale was treated as a continuous variable with a range of 7 to 25. The lower score on the scale showed more misbeliefs and unfavorable attitudes of a respondent.

The intervening variables were mother's age, educational level, and employment status; families' socioeconomic status as an ordinal variable (low-income, middle-income, and high-income); being exposed to secondhand smoking at home; having pets at home; and being born on due date (Table 1).

Ethical considerations

The research proposal was reviewed and approved by the Institutional Review Board (IRB) of American University of Armenia. The data collection process started after obtaining the approval. The consent was orally obtained in Armenian [Appendix 4]. The verbal consent form [Appendix 5] included a description of the study and its purpose, expected risks and

benefits, and assurances of confidentiality. Mother was informed that child's name and telephone number will be kept confidential, and only the summarized findings will be presented in the report. The participating mothers were informed that participation is voluntary and that refusing it involves no penalty, also that their refusal to participate will not influence the medical care their children receive. Only those mothers who agreed to participate in the study were interviewed.

RESULTS

A total of 141 asthmatic children ages 6-14 years were registered in the Allergology and Immunology Department of the "Arabkir" Medical Center at the time of the study (Figure 1). Of those, 14 mothers could not be contacted, 4 telephone numbers were wrong, one mother with her child were outside of Armenia, and one mother decided not to participate in the study. Thus, overall 121 mothers participated in the study. The eligibility rate was 86.5% and the response rate was 99.3%.

Basic Descriptive Statistics

Demographic data

In Table 2 demographic characteristics of respondents (mothers) and their asthmatic children are presented. The majority of children were boys (86%). The gender distribution among different age groups is given in Table 3. Children born on term comprised of 78% of all asthmatic children. Mothers and children were relatively equally distributed across age groups. The mean age of mothers was 36 years (ranging from 24-52 years). Nearly half (46%) of the participants had Institute/ University/ Postgraduate education and the majority (63%) were unemployed. A total of 30% and 31% of participants reported a monthly family

income of 30,000 – 100,000 AMD and 100,000 - 250,000 AMD, respectively and over half of them (57%) considered their family's general standard of living as average. Half (52%) of the participants were from Yerevan, 33% from other cities and 15% from villages. Children exposed to secondhand smoking at home comprised 54%. The number of siblings in families ranged from one to three and 14% of respondents reported having pets at home.

Mothers' beliefs and attitudes towards physical activity of asthmatic children

Over half, 55% (67/121), of the respondents agreed that physical activity is beneficial to the child's health. However, 69% (84/121) of them believed that physical activity might be a possible trigger for asthma attacks. A total 81% (98/121) of mothers thought that asthma attacks while participating sports is due to asthma not being properly controlled. At the same time, 51% (62/121) of the respondents believed that asthma symptoms can be worsened by exercise and 47% (57/121) considered that children with asthma should avoid exercising - of those, 1 in 5 mother (not shown in table) indicated that this was advised by their doctor.

Level of physical activity

A total of 84% (102/121) of the mothers reported that their child's physical activities were limited, and among them 60% (73/121) reported very limited activity levels for their children. Among the activities of running, running upstairs or uphill, dancing, riding a bike, laughing, climbing, tumbling, walking, jumping and playing with other children, the highest percent of limitations for asthmatic children included running (51%), running upstairs or uphill (50%) and jumping (35%) and less frequently – laughing (13%) and walking (6%).

Severity of asthma

The level of severity of the child's asthma was measured by survey items based on an international standard severity scale. Of asthmatic children, 44% were assessed as having

mild or mild/moderate asthma and 33% as having moderate/severe or severe asthma. Severity of asthma measured by the survey scale had the following distribution: mild – 62%, moderate – 21%, severe – 17%.

Simple and Multiple Linear Regressions (SLR and MLR)

The relationship between the dependent variable *level of physical activity* with the variable of interest *maternal beliefs and attitudes towards physical activity* and potential confounders was first analyzed using simple linear regression for unadjusted bivariate associations. The associations between *maternal beliefs and attitudes towards physical activity* with child's *level of physical activity* were found to be statistically significant. The results showed that *more positive* maternal beliefs and attitudes toward increased physical activity was associated with *higher* level of physical activity of their asthmatic child, unadjusted for potential confounders (Table 5). For every increase in three points in the *maternal beliefs and attitudes* scale, there was approximately an increase of one point on the *level of physical activity* scale. Also, *greater* severity of the child's asthma was shown to be associated with *lower* level of physical activity of their asthmatic child, unadjusted for potential confounders (Tables 6). For every approximately 2.5 point increase on the *severity of the child's asthma scale* there was a decrease of one point on the *level of physical activity* of their asthmatic child scale.

Using unadjusted simple linear regression, demographic characteristics of children such as age, gender, BMI, being born on due date, being exposed to secondhand smoking at home and SES (socioeconomic status) of the family were not statistically significantly associated with the outcome variable child's *level of physical activity*. Some socio-demographic characteristics of mothers - age, education, and employment status - were significantly

associated with the outcome variable and considered potential confounders (not shown on table).

Multiple linear regression (MLR) was carried out to explore associations, adjusted for potential confounders, between dependent and independent covariates to produce a final multivariate linear regression model. In MLR analysis, the associations between child's physical activity and mothers' demographic characteristics previously listed (age, education, and employment status) were no longer statistically significant, although the relations with maternal age and educational level were marginally significant, where $0.05<p<0.10$ (Table7). To the model above (Table 7), the severity variable was added (Table8). As a result, p-values of the relations with maternal age and educational level dropped to non-significant 0.23 and 0.86, respectively. The only two statistically significant covariates were *mother's beliefs and attitudes towards ph/a* and *severity of asthma* (Table 8). Thus, other non-significant covariates were dropped from the model to form the final MLR model (Table 9). Adjusting for each other, there were highly statistical significant *independent* associations for *mother's beliefs and attitudes towards ph/a* and *severity of asthma* with the *level of physical activity* of asthmatic child.

The final adjusted results showed that *more positive* maternal beliefs and attitudes towards increased physical activity was associated with *higher* level of physical activity of their asthmatic child, adjusted for potential confounding between the two covariates. For every increase in six points in the *maternal beliefs and attitudes* scale, there was approximately an increase of one point on the *level of physical activity* scale. Also, *greater* severity of the child's asthma was shown to be associated with *lower* level of physical activity of their asthmatic child, adjusting for potential confounding between the two covariates. For every approximately 5 point increase on the *severity of the child's asthma scale* there was a decrease of 4 point on the *level of physical activity* of their asthmatic child scale.

Testing for Correlations between Variables

Covariates included in the multivariate analysis were tested for collinearity in STATA using the variance inflation factor (VIF). None of the independent variables included in the multivariate linear regression modeling were shown to be significantly collinear. In the final model the *severity of asthma* and *maternal attitudes and beliefs* showed no significant collinearity (Table 9) and thus demonstrated independent associations with the outcome variable - *level of physical activity*.

DISCUSSION

The aim of the study was to assess maternal attitudes and beliefs and severity of asthma, and their associations with the level of physical activity of asthmatic children.

In the present study, it was found that about two-thirds of the participating mothers in Armenia considered physical activity as a possible trigger for asthmatic attacks; about half thought that asthma symptoms can be made worse by exercise and that children with asthma should avoid exercising. Similarly, findings in the United Kingdom of Great Britain found that 60.7% of mothers having asthmatic children reported that their child's asthma was a barrier to physical activity (25).

According to current international guidelines on managing asthma, a person diagnosed with asthma *should not* avoid physical activity; moreover, normal physical activity is recognized as one of the goals for optimal asthma control (2;8;10). Negative maternal attitudes and misbeliefs towards exercise and its relation to childhood asthma may lead mothers to restrict their asthmatic children from physical activities (24;25). Mothers have been shown to play a pivotal role in their children's physical activity (24;25;33-35;44).

Findings in the study show that the majority of asthmatic children's physical activities were limited. This is similar to the findings of many but not all studies conducted in different countries (13;24;26-30;45;46).

To evaluate the association between *mothers' beliefs and attitudes towards physical activity of asthmatic children* and the *level of physical activity of their children with asthma,* multiple linear regression analysis, with *level of physical activity of their children with asthma* as the dependent outcome variable and controlling for *severity of asthma,* was performed and a statistically significant positive association was found between these two factors. This showed that the *more* mothers believed that physical activity was beneficial for their asthmatic child, the *less* limited was their child's physical activity (independent of *severity of asthma)* ---or reversely the more mothers believed that physical activity was detrimental, the more limited was the child's physical activities. These findings are similar to those found in some published findings in other countries (24;25).

Health education and promotion interventions that change mothers' and some physicians' misbeliefs and negative attitudes towards physical activity may promote increased physical activity for their children, thus acquiring the benefit of reducing the severity of their asthma (24).

Severity of asthma was inversely statistically significantly associated with *level of physical activity of their children with asthma*. Based on these findings, though it is possible that increased severity of asthma limited physical activity, it is also possible that limited physical activity determined the measure of the severity of asthma. Though it is unclear which direction is casual in this study, published studies have found that both physical activity reduces severity of asthma *and* increased severity of asthma reduces physical activity (10;19;20;22).

The majority of eligible children were boys. Having about six times more boys than girls in a sample is unusual, as the internationally-published literature doesn't report such a discrepancy in the prevalence of asthma between genders (47). Because the study population was from one facility this finding cannot necessarily be generalized to all asthmatic children receiving treatment in Armenia, but the study does suggests that there may be differences in utilization of services. This finding requires further research.

Strengths and Limitations

A strength of the study is that this research was the first addressing maternal beliefs and attitudes towards asthmatic children's physical activity limitations in Armenia. Measurement of the level of physical activity in children is challenging.

The intermittent patterns and frequent short bursts that consist of physical activity by children are very difficult to measure (48). In the current study, child's physical activity participation was assessed by the mother's reporting in a systematic way. This approach to measuring their child's physical activity may be somewhat influenced by subjective impressions by the mother but has the advantage of producing an overall average measure of physical activity over longer periods of time, a strength over many direct methods of measurement using devices (49;50).

Also, because the study was cross-sectional in design the direction of causality was not always clear in some cases. Subjects being drawn from a single facility may restrict the generalizability of findings to all asthmatic children in Armenia

CONCLUSION AND RECOMMENDATIONS

The current study found that some mothers restrict the physical activity of their asthmatic children based on misbeliefs and detrimental attitudes towards physical activity and its relationship with asthma, and that this pattern is observed regardless of the severity of child's asthma. Thus, it is recommended that awareness among mothers and some physicians should be raised about the beneficial effects of physical activity for asthmatic children, leading to the reduction in restrictions of the activities of these children---thus improving asthma control. In addition, the possible imbalance between numbers of boys and girls utilizing treatment for asthma needs further study.

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APPENDICES

APPENDIX 1 Questionnaire

Questionnaire #____ Child's ID _____ Date of interview _____ 2011

1. How old are you? _____

2. Are you currently employed? 1.□ Yes 2.□ No (skip to Q 4)

3. What is your occupation? _____

4. What is your level of education? 1.□ School (up to 10 years)
2.□ Technical / Secondary special
3.□ Institute/ University/ Postgraduate

5. Do you have pets in your home? 1.□ Yes, specify _____ 2.□ No

6. Has your child ever missed school because of asthma? 1.□ Yes 2.□ No (skip to Q.8)

7. During the last month, how many days of school did he/she miss because of his/her asthma?
__days

8. How many people live in your household, including you? _____

9. How many siblings (other than this child) are there in your family? _____

10. Does somebody in your household currently smoke? 1.□Yes 2.□ No

Do you agree that?

		Strongly agree	***Agree***	***Neither agree nor disagree***	***Disagree***	***Strongly disagree***
11	Physical activity is beneficial for health of a child with asthma	**1**	**2**	**3**	**4**	**5**
12	Many triggers exist that can cause asthma attack	**1**	**2**	**3**	**4**	**5**
13	One of these triggers is physical activity	**1**	**2**	**3**	**4**	**5**
14	If someone smokes around a child with asthma, it might make the child cough, but it is not really harmful	**1**	**2**	**3**	**4**	**5**
15	When child has an attack of asthma during sport, it is because his/her asthma is not properly controlled	**1**	**2**	**3**	**4**	**5**

16. Asthma symptoms can be made worse by exercise.
1. □ Strongly agree
2. □ Agree
3. □ Neither agree nor disagree
4. □ Disagree
5. □ Strongly disagree

16 a. From where/whom have you heard about this?

1. □ Child's doctor
2. □ Relatives
3. □ Neighbors
4. □ Media (publications, TV, internet etc.)
5. □ Other (specify) _____

17. Children with asthma should avoid exercising.
1. □ Strongly agree
2. □ Agree
3. □ Neither agree nor disagree
4. □ Disagree
5. □ Strongly disagree

17 a. From where/whom have you heard about this?

1. □ Child's doctor
2. □ Relatives
3. □ Neighbors
4. □ Media (publications, TV, internet etc.)
5. □ Other (specify)

18. Which of the following best describes your child's asthma controlling status?

1.□ Most of the time well controlled
2.□ Most of the time somehow controlled
3.□ Most of the time poorly controlled
4.□ Most of the time not controlled at all

19. Usually, which medication does your child use to control symptoms?

1.□ Oral $beta_2$-agonist
2.□ Inhaled $beta_2$-agonist
3.□ Inhaled steroid
4.□ Systemic steroid
5.□ Other (specify) _____
6. □ Don't know

20. On average, during the past week, how many times has your child used his/her rescue medication?

1. □ Less than two days during the week
2. □ More than 2 days during the week, but not daily
3. □ Daily

21. How confident do you feel you are in taking actions that will help prevent your child from getting an asthma attack?
1.□ Very confident
2.□ Somewhat confident
3.□ Uncertain
4.□ Not confident

Please think of how asthma limits your child's life. I am particularly interested in activities that he/she does but which are limited by asthma. He/she may do these activities less often, or less well, or may enjoy them less.
I'm going to read a list of things your child may have done in the last month. Because of his/her asthma, he/she may have found some of these activities difficult to do or not very much fun. Please, tell me if he/she has been limited in this activity because of his/her asthma in the last month.

22.		**Limited**	**Not limited**	**NA**
a	Running upstairs or uphill	**1**	**2**	**3**
b	Running	**1**	**2**	**3**
c	Dancing	**1**	**2**	**3**
d	Riding a bike	**1**	**2**	**3**
e	Laughing	**1**	**2**	**3**
f	Climbing	**1**	**2**	**3**
g	Tumbling	**1**	**2**	**3**
h	Going for a walk	**1**	**2**	**3**
i	Jumping	**1**	**2**	**3**
g	Playing with other children	**1**	**2**	**3**
k	Playing with Pets	**1**	**2**	**3**

23. In general, during the past month, how limited was your child in his/her activities because of his/her asthma?
1.□ Very limited
2.□ Somehow limited
3.□ Not limited

24. Has your child, at any time in the last month, had an attack of shortness of breath that came on after his/her stopped exercising?
1.□ Yes
2.□ No
3.□ Can't remember

25. During the last month, how worried or concerned were you about your child's performance of normal daily activities?
1.□ Very worried or concerned
2.□ Somewhat worried or concerned
3. □ Not worried nor concerned

26. During the last month, how worried or concerned were you about being overprotective of your child?
1.□ Very worried or concerned
2.□ Somewhat worried or concerned
3.□ Not worried nor concerned

Now I'm going to ask about symptoms that your child has.

		Never	Less than weekly	Weekly	Daily	Don't know not sure
27	In the last month, how often did your child has attacks of wheezing, or wheezing that was worse than usual?	**1**	**2**	**3**	**4**	**5**
28	In the last month, how often did he/she wake up at night with cough or wheezing?	**1**	**2**	**3**	**4**	**5**
29	In the last month, how often did his/her wheezing really bother him/her during the daytime?	**1**	**2**	**3**	**4**	**5**

30. For the last month, which of the following best describes his/her breathing?

1.□ He/she hardly ever has trouble with his/her breathing
2.□ He/she sometimes has trouble with his/her breathing
3.□ He/she almost always has trouble with his/her breathing
4.□ He/she always has trouble with his/her breathing

Now I am at the end of Questionnaire and I would like to ask you some questions about your child's medical history.

31. Was he/she born on his/her due date? 1.□Yes 2.□ No

32. How much did he/she weigh at birth? _____

33. Did he/she have trouble with breathing right after birth? 1.□Yes
2.□ No
3.□ Don't know

34. Does he/she have any of the following medical problems?

		Yes	No
a	Ear infections	**1**	**2**
b	Eczema (skin rash)	**1**	**2**
c	Hives (welts)	**1**	**2**
d	Runny nose, watery eyes, and sneezing not related to a cold	**1**	**2**
e	Sinusitis (sinus headache)	**1**	**2**

35. Is there a history of asthma or allergy in your family?

1.□Yes (Go to Q.35 a.)
2.□ No

35 a. Please tell us which of the child's relatives have asthma or the allergic reactions?

1.□ Grandparents
2.□ Parents
3.□ Brothers/Sisters
4.□Uncles/Aunts
5.□ Cousins
6.□ Other (specify) _____

36. How would you rate your family's general standard of living?

1. □ Below average
2.□ Average
3.□ Above average
4.□ Not sure/difficult to answer

37. During 2010 year the approximate amount of household income of your household members per month was:

1.□ Less than 30,000 drams
2.□ From 31,000 – 100,000 drams
3.□ From 101,000 – 250,000 drams
4.□ Above 250,000drams
5.□ Don't know

Thank you
For participation

APPENDIX 2 Հարցաթերթիկ

Հարցաթերթիկ #_____ Տարբերակման համարը (ID _____ Հարցման ամսաթիվը՝_____ 2011

1. Ձեր տարիքը՝ _____

2. Ներկայումս աշխատում եք՝ 1.□ Այո 2.□ Ոչ (անցնել Հ.4)

3. Ձեր աշխատանքի բնույթը՝ _____

4. Ձեր կրթության աստիճանը՝ 1. □ Միջնակարգ
2. □ Ուսումնարան
3. □ Բարձրագույն / Հետբուհական

5. Տանը որևէ ընտանի կենդանի պահո՞ւմ եք՝ 1.□ Այո (նշել)_____ 2. □ Ոչ

6. Ձեր երեխան երբևէ բացակայե՞լ է դպրոցից իր ասթմայի պատճառով՝
1.□ Այո
2. □ Ոչ (անցնել Հ.8)

7. Անցյալ ամսվա ընթացքում Ձեր երեխան քանի՞ օր է բացակայել դպրոցից իր ասթմայի պատճառով՝ _____ օր:

8. Ձեր ընտանիքի անդամների քանակը, որոնք ապրում են ձեզ հետ՝ _____ հոգի:

9. Ձեր երեխայի քույր/եղբայրների քանակը ընտանիքում՝ _____

10. Ներկայումս Ձեր ընտանիքում որևէ մեկը ծխո՞ւմ է՝ 1. □ Այո
2. □ Ոչ

Խնդրում եմ ընտրեք Ձեր համաձայնության աստիճանը հետևյալ պնդումների վերաբերյալ՝

		Միանգամայն համաձայն եմ	**Համաձայն եմ**	**Ոչ համաձայն եմ, ոչ էլ համաձայն չեմ**	**Համաձայն չեմ**	**Բոլորովին համաձայն չեմ**
11	Ֆիզիկական ակտիվությունը օգտակար է ասթմայով երեխայի համար	**1**	**2**	**3**	**4**	**5**
12	Տարբեր խթանիչ գործոններ կան, որոնք կարող են ասթմայի գրոհի պատճառ հանդիսանալ	**1**	**2**	**3**	**4**	**5**
13	Այդ խթանիչների թվում է ֆիզիկական ակտիվությունը	**1**	**2**	**3**	**4**	**5**

14	Երբ ասթմայով երեխայի մոտ ծխում են, դա կարող է հազ առաջացնել, բայց դա վտանգավոր չէ երեխայի համար	**1**	**2**	**3**	**4**	**5**
15	Սպորտով զբաղվելու ընթացքում երեխայի ասթմայի գրոհի պատճառն է ոչ լիարժեք բուժումը	**1**	**2**	**3**	**4**	**5**

16. Մարմնամարզությունը կարող է բարդացնել ասթմայի ախտանշանները:

1. □ Միանգամայն համաձայն եմ
2. □ Համաձայն եմ
3. □ Ոչ համաձայն եմ, ոչ էլ համաձայն չեմ
4. □ Համաձայն չեմ
5. □ Բոլորովին համաձայն չեմ

16 ա. Որտեղի՞ց/Ումի՞ց եք լսել այդ մասին՝

1. □ Երեխայի բժշկից
2. □ Բարեկամներից
3. □ Հարևաններից
4. □ Զանգվածային լրատվության միջոցներից (թերթեր, ամսագրեր, հեռուստատեսություն, ինտերնետ)
5. □ Այլ (նշել) _____

17. Ասթմայով հիվանդ երեխաները պետք է խուսափեն սպորտային վարժություններից:

1. □ Միանգամայն համաձայն եմ
2. □ Համաձայն եմ
3. □ Ոչ համաձայն եմ, ոչ էլ համաձայն չեմ
4. □ Համաձայն չեմ
5. □ Բոլորովին համաձայն չեմ

17 ա. Որտեղի՞ց/Ումի՞ց եք լսել այդ մասին՝

1. □ Երեխայի բժշկից
2. □ Բարեկամներից
3. □ Հարևաններից
4. □ Զանգվածային լրատվության միջոցներից (թերթեր, ամսագրեր, հեռուստատեսություն, ինտերնետ)
5. □ Այլ (նշել) _____

18. Ո՞րն է լավագույնս բնութագրում Ձեր երեխայի ասթմայի բուժման հսկողությունը:

1. □ Մեծ մասամբ լավ հսկված է
2. □ Մեծ մասամբ որոշ չափով հսկված է
3. □ Մեծ մասամբ թերի է հսկված
4. □ Մեծ մասամբ ընդհանրապես հսկված չէ

19. Սովորաբար, Ձեր երեխան ո՞ր դեղամիջոցն է ընդունում ասթմայի ախտանշանները կասեցնելու համար՝

1. □ β_2-ագոնիստ հաբեր
2. □ β_2-ագոնիստ ինհալատորի միջոցով
3. □ Ստերոիդների ինհալացիա
4. □ Ստերոիդներ ներերակային
5. □ Այլ (նշել) _____
6. □ Չգիտեմ / դժվարանում եմ պատասխանել

20. Միջինում, անցյալ շաբաթվա ընթացքում, Ձեր երեխան քան՞ի անգամ է իր դեղորայքն ընդունել:

1. □ 2 օրից պակաս շաբաթվա ընթացքում
2. □ 2 օրից ավել, բայց ոչ ամեն օր
3. □ Ամեն օր

21. Ինչքանո՞վ եք վստահ, որ կատարում եք միջոցառումներ, որոնք կանխարգելում են Ձեր երեխայի ասթմայի նոր գրոհը:

1. □ Լիովին վստահ եմ
2. □ Մասամբ վստահ եմ
3. □ Համոզված չեմ
4. □ Վստահ չեմ

Հիմա խնդրում եմ մտածեք՝ ինչքանո՞վ է ասթման սահմանափակում Ձեր երեխայի կենսակերպը: Հատկապես ինձ հետաքրքրում է երեխայի առօրյա ակտիվությունը, որը ասթմայի հետևանքով կարող է սահմանափակված լինել: Երախան կարող է պակասեցնել իր առօրյա ակտիվությունը, կամ կատարել ավելի քիչ եռանդով:
Ես հիմա կկարդամ առօրյա գործողությունների ցանկ: Խնդրում եմ վերհիշեք, անցյալ ամսվա ընթացքում սահմանափակե՞լ է արդյոք երեխան նշված գործողությունները իր ասթմայի պատճառով:

22.		**Սահմանափակ է**	**Սահմանափակ չէ**	**Կիրառելի չէ**
ա	Վազքով ստիճաններով կամ սար բարձրանալ	**1**	**2**	**3**
բ	Վազել	**1**	**2**	**3**
գ	Պարել	**1**	**2**	**3**
դ	Հեծանիվ քշել	**1**	**2**	**3**
ե	Ծիծաղել	**1**	**2**	**3**
զ	Մագլցել	**1**	**2**	**3**
է	Գլուխկոնծի տալ	**1**	**2**	**3**
ը	Ձրոսնել	**1**	**2**	**3**
թ	Ցատկել	**1**	**2**	**3**
ժ	Երեխաների հետ խաղալ	**1**	**2**	**3**
ի	Ընտանի կենդանիների հետ խաղալ	**1**	**2**	**3**

23. Ընդհանուր առմամբ, անցյալ ամսվա ընթացքում ինչքանո՞վ է Ձեր երեխան սահմանափակել իր առօրյա գործունեությունը ասթմայի պատճառով:

1. □ Շատ է սահմանափակել
2. □ Մասամբ է սահմանափակել
3. □ Չի սահմանափակել

24. Անցյալ ամսվա ընթացքում, երբևիցէ պատահե՞լ է Ձեր երեխայի մոտ շնչահեղձություն մարզվելուց կամ ֆիզիկական ակտիվությունից հետո:

1.□ Այո
2.□ Ոչ
3. □ Չեմ հիշում

25. Անցյալ ամսվա ընթացքում ինչքանո՞վ եք մտահոգված եղել Ձեր երեխայի առօրյա գործողությունների կատարման վերաբերյալ:

1. □ Շատ մտահոգված
2. □ Մասամբ մտահոգված
3. □ Մտահոգված չեմ եղել

26. Անցյալ ամսվա ընթացքում ինչքանո՞վ եք մտահոգված եղել անհանգստացած լինելով Ձեր երեխայի վերաբերյալ:

1. □ Շատ մտահոգված
2. □ Մասամբ մտահոգված
3. □ Մտահոգված չեմ եղել

Հիմա մի քանի հարց կուզեի տալ Ձեր երեխայի ախտանշանների վերաբերյալ:

		Երբեք	**Շաբաթական մեկ անգամից պակաս**	**Ամեն շաբաթ**	**Ամեն օր**	**Չգիտեմ/ համոզված չեմ**
27	Անցյալ ամսվա ընթացքում, ինչքա՞ն հաճախ է Ձեր երեխան ծանր շնչառություն ունեցել	**1**	**2**	**3**	**4**	**5**
28	Անցյալ ամսվա ընթացքում, ինչքա՞ն հաճախ է Ձեր երեխան գիշերը արթնացել ծանր շնչառությամբ և հազով	**1**	**2**	**3**	**4**	**5**
29	Անցյալ ամսվա ընթացքում, ծանր շնչառությունը ինչքա՞ն հաճախ է անհանգստացրել Ձեր երեխային ցերեկվա ընթացքում	**1**	**2**	**3**	**4**	**5**

30. Անցյալ ամսվա ընթացքում ինչպե՞ս կբնութագրեիք Ձեր երեխայի շնչառությունը՝

1. □ Երեխան հազիվ թե խնդիրներ է ունեցել շնչառության հետ կապված
2. □ Երեխան երբեմն ունեցել է խնդիրներ շնչառության հետ կապված
3. □ Երեխան համարյա միշտ ունեցել է խնդիրներ շնչառության հետ կապված
4. □ Երեխան միշտ ունեցել է խնդիրներ շնչառության հետ կապված

Եվ հարցազրույցի ավարտին կուզենայի մի քանի հարց տալ Ձեր երեխայի հիվանդության պատմության վերաբերյալ:

31. Երեխայի ծնունդը ժամկետայ՞ին է եղել՝ 1. □ Այո 2. □ Ոչ

32. Երեխայի քաշը ծնվելիս _____ գրամ

33. Ծնվելուց անմիջապես հետո շնչառության հետ որևիցե խնդիրներ ունեցե՞լ է:

1. □ Այո
2. □ Ոչ
3. □ Չգիտեմ

34. Երեխան ուն՞ի հետևյալ խնդիրները՝

		Այո	**Ոչ**
ա	Ականջի բորբոքում	**1**	**2**
բ	Մաշկի ցանավորում	**1**	**2**
գ	Եղնջացան	**1**	**2**
դ	Քթից արտադրություն, արցունքահոսություն, փռշտոց, որոնք կապված չեն մրսածության հետ	**1**	**2**
ե	Հարքթային խոռոչների բորբոքում (սինուսիտ)	**1**	**2**

35. Ձեր ընտանիքում կա՞ն ասթմայով կամ ալերգիայով հիվանդ անձինք՝

1. □ Այո (անցնել Հ. 35ա.)
2. □ Ոչ

35 ա. Խնդրում եմ նշեք բարեկամներից ո՞վ ունի ասթմա կամ ալերգիա՝

1. □ Տատիկ/պապիկ
2. □ Ծնող
3. □ Քույր/եղբայր
4. □ Քեռի, հորեղբայր/հորաքույր, մորաքույր
5. □ Քեռու/հորեղբոր, հորաքույր/մորաքույրի տղա/աղջիկ
6. □ Այլ (նշել) _____

36. Ընդհանուր առմամբ, ինչպե՞ս կգնահատեք Ձեր ընտանիքի կենսամակարդակը՝

1. □ Միջինից ցածր
2. □ Միջին
3. □ Միջինից բարձր
4. □ Համոզված չեմ/Դժվարանում եմ պատասխանել

37. 2010 թվականին Ձեր ընտանիքի բոլոր անդամների կողմից ունեցած միջին ամսեկան եկամուտը կազմել է՝

1. □ < 30,000 դրամ
2. □ 31,000 – 100,000 դրամ
3. □ 101,000 – 250,000 դրամ
4. □ Ավելի քան 250,000 դրամ
5. □ Համոզված չեմ / Դժվարանում եմ պատասխանել

Շ Ն Ո Ր Հ Ա Կ Ա Լ Ո Ւ Թ Յ Ո Ւ Ն

մասնակցության համար

APPENDIX 3 Sample of Patient Information Form

ID	Phone	Date of birth	Weight kg	Height m	BMI	Severity taken from record	Residence	Date of contact	Result

APPENDIX 4 Բանավոր համաձայնության տեքստ

Ես Հայաստանի ամերիկյան համալսարանի ուսանող եմ: Իմ անունն է Էլինա Շահումյան: Այս հետազոտությունը 6-14 տարեկան ասթմայով երեխաների ֆիզիկական ակտիվության հանդեպ մայրական վերաբերմունքի մասին է: Մենք հրավիրում ենք Ձեզ մասնակցելու այս հետազոտությանը, որովհետև Դուք ունեք 6-14 տարեկան ասթմայով հիվանդ երեխա: Դուք պատահականության սկզբունքով ընտրվել եք "Արաբկիր" բժշկական կենտրոնի կողմից տրամադրված ցուցակից: Ձեր տրամադրած գիտելիքները հնարավորություն կընձեռեն մեզ ավելի լավ հասկանալու ասթմայով հիվանդ երեխաների ֆիզիկական ակտիվությանը վերաբերող իրավիճակը: Հետազոտության արդյունքները միգուցե օգտակար լինեն ապագայում բարեփոխումներ կատարելու նպատակով:

Հարցազրույցը կտևի ոչ ավել քան 15 րոպե: Ես հարցեր կուղղեմ Ձեր ասթմայով երեխայի և նրա ֆիզիկական ակտիվության վերաբերյալ:

Դուք, մասնակցելով այս հետազոտությանը, որևէ ռիսկի չեք դիմում: Դուք որևէ օգուտ չեք ստանալու մասնակցությունից: Ձեր անձնական փորձը և մասնակցությունը կաջակցի այս հետազոտությանը: Հարցազրույցի ընթացքում ստացած ինֆորմացիան կարող է օգտակար լինել հետագա կրթական ծրագրերի համար: Միակ անհարմարությունը Ձեր համար դա ժամանակի տրամադրումն է: Ձեր մասնակցությունը կամավոր է: Դուք կարող եք չմասնակցել, կամ ընդհատել հարցազրույցը ցանկացած պահի: Այս հետազոտությանը մասնակցելուն հրաժարվելը ոչ մի կերպ չի անդրադառնա Ձեր երեխայի բուժման ընթացքի վրա:

Հավաքված ինֆորմացիան կպահպանվի գաղտնի, և միայն ընդհանուր արդյունքները կհրապարակվեն:

Եթե Դուք ավելի շատ ինֆորմացիայի կարիք ունեք այս հետազոտության վերաբերյալ, կարող եք կապվել հետազոտողների հետ հետևյալ հեռախոսահամարներով՝
Պրոֆեսոր Բայրոն Քրեյփ՝ 51 25 70 (անգլերեն), e-mail: bcrape@aua.am;
Էլինա Շահումյան՝ 091 98 98 33, e-mail: elina_shahumyan@edu.aua.com :
Եթե Դուք գտնեք, որ տվյալ հետազոտության ընթացքում Ձեզ որևէ վնաս է պատճառվել, կամ Ձեր հետ անարդար են վերաբերվել, Դուք կարող եք դիմել Վարդուհի Պետրոսյանին՝ 51 25 92 հեռախոսահամարով:

Համաձա՞յն եք մասնակցել այս հետազոտությանը:

APPENDIX 5 The Text of Consent Form

I am a student at the American University of Armenia. My name is Elina Shahumyan. I am conducting a research study about maternal attitudes towards physical activity of asthmatic children aged 6-14 years. You are asked to participate in the study because you are mother of a child aged 6-14 years having asthma. You were randomly chosen from the list which was provided by the Arabkir Medical Centre. We invite you to participate in this study because the knowledge gathered from you and other participants will allow us to better understand the situation with childhood asthma and the study's findings can be used to make appropriate recommendations.

The interview will last less than 15 minutes. I will ask you questions about different aspects regarding childhood asthma and physical activity.

There is no risk for you as a participant in this study. You will not receive any benefit from the participation. Your personal experience and participation would contribute to this study. Information that you will provide during the survey might be very helpful for the future educational programs concerning childhood asthma. Your only inconvenience will be your time spent on the interview. Your participation is entirely voluntary. You have the right not to participate and you can stop the interview at anytime. Your refusal to participate will not influence the medical care your child receives.

Your child name will be kept confidential and only the general findings will be presented in the report.

If you need more information about the study, please do not hesitate to contact the investigators in charge of this study:
Professor Byron Crape: telephone: 51 25 70 e-mail: bcrape@aua.am;
Elina Shahumyan: telephone: 091 98 98 33, e-mail: elina_shahumyan@edu.aua.com.

If you want to talk to anyone about the research study because you may feel you have not been treated fairly or think you have been hurt by joining the study you should contact Varduhi Petrosyan – 51 25 92.

Do you choose to participate in this survey?

TABLES

Table 1 Characteristics of variables

VARIABLES	TYPE	MEASURMENT
D E P E N D E N T		
*Child's level of ph/a**	continuous	Computed from the counts of limited activity responses to the ph/a limitation questions
Severity of asthma	continuous	Computed from the number of attacks during days and nights
I N D E P E N D E N T		
Mothers' beliefs and attitudes towards ph/a of children with asthma	continuous	Computed from the counts of correct and incorrect responses to beliefs and attitude questions
Child's level of physical activity	continuous	Computed from the counts of limited activity responses to the ph/a limitation questions
I N T E R V E N I N G		
Being born on due date	binomial	0 = No 1 = Yes
Being exposed to secondhand smoking at home	binomial	0 = No 1 = Yes
Mother's age	continuous	Numbers of years
Mother's educational level	ordinal	1 = School (up to 10 years) 2 = Technical / Secondary special 3 = Institute/ University/ Postgraduate
Mother's employment status	binomial	1=Employed 2=Unemployed
Families' SES	ordinal	1 = Below average 2 = Average 3 = Above average
Mother's concern about their children asthma and physical activities	ordinal	1 = Very worried or concerned 2 = Somewhat worried or concerned 3 = Not worried nor concerned
Having pets at home	binomial	0 = No 1 = Yes

*ph/a – physical activity

Table 2 Demographic characteristics

	%	N
Child's gender		
Boys	85.9%	104/121
Girls	14.1%	17/121
Child's age		
6-8	24.8%	30/121
9-11	39.7%	48/121
12-14	35.5%	43/121
Being born on due date		
Yes	77.7%	94/121
No	22.3%	27/121
Mothers' age		
25-32	30.3%	36/119
33-36	27.7%	33/119
37-40	27.7%	33/119
41-52	14.3%	17/119
Mothers' educational level		
School (up to 10 years)	23.1%	28/121
Technical/Secondary special	30.6%	37/121
Institute/University/Postgraduate	46.3%	56/121
Mother's employment status		
Yes	37.2%	45/121
No	62.8%	76/121
Families' SES		
Below average	27.7%	33/119
Average	57.1%	68/119
Above average	15.1%	18/119
Residence		
Yerevan	52.1%	63/121
Other city	33.1%	40/121
Village	14.9%	18/121
Smoking in household		
Yes	53.7%	65/121
No	46.3%	56/121
Having pets at home		
Yes	14.1%	17/121
No	85.9%	104/121

Table 3 Child's gender by age categories

Age (years)	Gender		
	Female	Male	Total
6 - 8	3% (4/121)	21% (26/121)	25% (30/121)
9 - 11	6% (7/121)	34% (41/121)	40% (48/121)
12 -14	5% (6/121)	31% (37/121)	35% (43/121)
Total	14% (17/121)	86% (104/121)	100% (121/121)

Table 4 Simple Linear Regression analyses between mothers' beliefs and attitudes towards ph/a and level of ph/a of their child with asthma*

Independent variable	Coefficient	p-value	95% confidence interval
Mothers' beliefs and attitudes towards ph/a	**0.35**	**< 0.01**	**0.21 - 0.49**

Dependent variable: level of ph/a *ph/a – physical activity

Table 5 Simple Linear Regression analyses between level of ph/a among children with asthma and severity of asthma*

Independent variable	Coefficient	p-value	95% confidence interval
Level of ph/a among children with asthma	**-0.44**	**< 0.01**	**-0.53 - -0.34**

Dependent variable: severity of asthma *ph/a – physical activity

Table 6 Multiple Linear Regression with child's level of ph/a as an outcome variable*

Independent variables	Coefficient	p-value	95% confidence interval
Mother's beliefs and attitudes towards ph/a	**0.28**	**< 0.01**	**0.14 - 0.43**
Mother's age	**-0.09**	**0.06**	**-0.21 - 0.01**
Employment status	**0.94**	**0.16**	**-0.38 - 2.26**
Education	**0.70**	**0.09**	**-0.12 - 1.53**

Dependent variable: level of ph/a * ph/a – physical activity

Table 7 Multiple Linear Regression with child's level of ph/a as an outcome variable*

Independent variables	Coefficient	p-value	95% confidence interval
Mother's beliefs and attitudes towards ph/a	**0.14**	**0.03**	**0.01 – 0.27**
Mother's age	**-0.06**	**0.23**	**-0.15 – 0.35**
Education	**0.06**	**0.86**	**-0.61 – 0.73**
Severity	**-0.82**	**< 0.01**	**-1.06 – -0.58**

Dependent variable: level of ph/a *ph/a – physical activity

Table 8 Final Predictive Model (multiple linear regression) with child's level of ph/a as an outcome variable*

Independent variables	Coefficient	p-value	95% confidence interval
Mothers' beliefs and attitudes towards ph/a	**0.16**	**0.01**	**0.04 – 0.29**
Severity of asthma	**-0.85**	**< 0.01**	**-1.06 – -0.63**

Dependent variable: level of ph/a *ph/a – physical activity

Table 9 Testing for collinearity in final model

Variable	VIF*	1/VIF
Mothers' beliefs and attitudes towards ph/a	1.17	0.86
Severity of asthma	1.17	0.86

Mean VIF (*variance inflation factor) between predictive variables = **1.17**

FIGURES

Figure 1 Study population