A descriptive study of age at menarche, BMI and the relation of hygiene practices with urinary tract infections in upper-middle income women

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ABSTRACT

Menarche has always been associated, since the ancient times, with cultural and religious elements. The practices undertaken during menstruation have great role to play in the health of a woman. A cross-sectional study was designed to gain knowledge on the age at menarche, practices during menstruation and medication trends among upper-middle income women in Pakistan. This study involved a door to door survey over a period of six months, from January, 2014 to June, 2014, under the surveillance of trained surveyors. The average age at menarche was found to be 12.5 ($\pm$1.21) years. Our study found a significant association between age at menarche and BMI (<0.001). Chi-square test showed strong association (<0.001) between the use of unhygienic absorbing material and incidence of UTIs among upper-middle income women. There were 32% women in the upper-middle income practicing self-medication for dysmenorrhoea in Pakistan. The study has concluded that there is a need to promote health and hygiene education among females in Pakistan. Our study findings added to the existing knowledge of practices undertaken by females in Pakistan during their menstruation cycle.

Keywords: Menarche, BMI, Urinary Tract Infection, Hygiene, Dysmenorrhoea
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INTRODUCTION

Menarche has always been associated, since the ancient times, with cultural and religious elements[1]. The practices undertaken during menstruation have great role to play in the health of a woman. Early menarche can be attributed to several factors such as; geographical climate, nutritional status, socioeconomic status, hormonal levels and physiology of the individual [2-6]. The average age at menarche in international literature has been reported to be around 12 to 13 years [2, 7-9].

A study conducted in squatter settlements of Karachi, Pakistan [7] reported certain practices regarding female hygiene such as; not bathing during menstruation and reusing old cloth as the absorbent. As a result of such practices, poor hygiene prevails that leads to frequent urinary tract infections (UTIs). Use of old cloth is a running practice in most areas of the country which leads to an increased disease burden of UTIs from fungal and bacterial growth in the cloth.

Few studies have looked into the perceptions of women regarding their physique and sexuality in Pakistan [10]. A study conducted in Karachi, showed a significant level of misperception among female students about their body weight and height [11]. The same study concluded that many females perceived their body weight to be less than their actual weight, while their heights were measured to be shorter than what they had reported. There is evidence showing that female body weight and height are related to their age at menarche and the adequate nutritional status has a role to play in the proper growth of a female body [10, 11].

The study of the age of menarche helps in planning out the provision of appropriate education to female students in schools regarding their physical and sexual health. This has become an integral practice in the West but Pakistani schools are still lagging behind regarding such practices.

A few studies have shown that painful menstruation (dysmenorrhea) can significantly affect the quality of daily life especially of those who are studying or working [2, 12-14]. There is an increasing trend regarding the use of analgesics during menstruation in such females. The rise in the use of analgesics, which are easily available at drug stores, is alarming particularly for the developing parts of the world where the incidences of medication-error and self-medication are exceptionally high.

A lot of international and non-governmental organizations have contributed in the research work done on women and their health in Pakistan. However, the main focus has been the rural and sub-urban female population in the country. The purpose of this study was to analyse the practices among upper-middle income and educated class so, in future, a comparison could be generated between the beliefs and practices of lower and upper income classes in Pakistan.

EXPERIMENTAL SECTION

This was a cross-sectional study involving a door to door survey over a period of six months, from January, 2014 to June, 2014, under the surveillance of trained surveyors.

A total of 1200 females were recruited in this study. The study was designed to target upper middle-income households and for that purpose, three residential societies in the metropolis of Karachi were selected; the North-Nazimabad, the Federal B area and the Gulshan-e-Iqbal town. The surveyors were divided into three groups; each of them recruited 400 females from the households in each town. The houses within each street of the residential societies were selected randomly considering that some households could refuse to participate.

The surveyors within each town continued to survey the neighbourhoods within the town until 400 participants were recruited. Households within the streets with commercial projects, apartments and small industries, as was the case with few in the FB area, were excluded from the survey. All the participants were permanent residents of Karachi and were fluent in Urdu.

A quantitative type questionnaire was designed that was comprised of 25 questions. The variables generated from the questionnaire were coded appropriately for statistical analysis. Weight and height of the participants were measured by the surveyors and body mass index (BMI) for each participant was calculated using the WHO-standard formula (kg/m^2).

A group of surveyors from the clinical pharmacy group, faculty of pharmacy, Jinnah University for Women (JUW), Karachi, was trained by the principal investigators, on recruiting the participants and administration of the questionnaire.

Ethical approval for the study was obtained by the board of research, JUW, Karachi. The participation in this study was solely on voluntary basis. The participant's name was not written on the questionnaire instead a serial number was allotted to all questionnaires for the purpose of identification. No other identifiable information was recorded and kept other than what was required by the questionnaire for the purpose of analysis.

The data were recorded by hand on to the excel worksheet by the investigators. After the completion of the study, the data were transferred to Stata 11, and rechecked for errors, and the descriptive statistics were calculated. The data were coded into categories for appropriate statistical testing. Chi-square square test was performed for associations. The results were presented in tabular form.

RESULTS

A total of 1200 adult female participants filled out the questionnaires, among which only 1005 had complete information and were included in statistical analysis. The ages of the respondents were between18 and 40 years. The mean age at menarche was found to be 12.5 (SD=1.21) years. Figure-1 displays that 63% of the participants experienced menarche between the age of 12 and 14. Our study showed a statistically significant association between the age at menarche and height and weight and BMI (table-1).
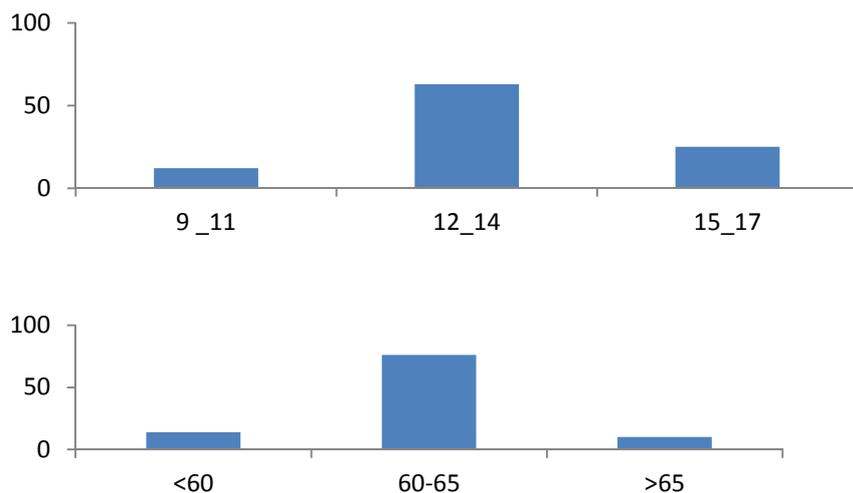
Figure-1: (from top to bottom) Age at menarche, Height versus age at menarche, p value<0.001

Table-1 Characteristics of participating population

Mean age	22years
Age at menarche*	Mean age=12.5 years
<11 years	N=123 (12%)
12-14 years	N=629 (63%)
15-17 years	N=249 (25%)
BMI (kg/m^2)	Mean BMI = 22.16
<16	N=10 (1.01%)
16.1-18.49	N=191 (19%)
18.5-24.9	N=583 (58%)
25.0-29.9	N=170 (17%)
>30	N=50 (5%)
Height (inches)	Mean ht = 62
<60	14%
60-65	76%
>65	11%

Chi-square test for age at menarche and BMI = P<0.001, Chi-square test for age at menarche and height = P<0.001

Table-2 Menstrual problems among respondents of upper middle class society in Karachi

Dysmenorrhea (painful menstruation)	n=1005
Yes	n=723 (72%)
No	n=282 (28%)
Menstrual cycle	n=1005
Regular	n=763 (76%)
Irregular	n=242 (24%)
Menstruation days	n=1005
<5 days	n=300 (38%)
5-7 days	n=380 (38%)
>7 days	n=260 (26%)
Menstrual flow	N=1005
Normal	N=663 (66%)
Heavy	N=341 (33%)
Abnormal discharge between cycle	N=1005
Yes	N=573 (57%)
No	N=432(43%)
Urinary tract infection	N=1005
Yes	N=586 (58%)
No	N=419 (42%)

Table-2 shows that most of the participants experienced regular menstrual cycle comprised of 5 – 7 menstruation days. Almost 66% of the participants reported normal menstrual flow however; a vast majority (72%) reported dysmenorrhoea. Just above half of the participants reported abnormal discharge before or after menstruation and almost the same number reported UTIs (table-2).

Our study found a statistically significant association between hygiene practices and UTIs (p value <0.001). Cross-tabulation between absorbing material (cloth and sanitary napkins) showed that more user of cloth reported UTIs. However, no statistically significant association could be found between hygiene practices and abnormal discharge. It is important to note that among 573 participants who reported UTIs in this study, only half of them (304) sought medical advice for the proper diagnosis/treatment, while others relied on home-based remedies or on improving hygiene; washing the pubic area more frequently and/or using vaginal douches.

There were only 348 (34%) participants who properly responded regarding the use of analgesics for dysmenorrhoea (table-3). The highest percentage (49%) was recorded for mefenamic acid (Ponston). Table-3 shows the trend of different over-the-counter (OTC) analgesics among the study population.

The study targeted upper-middle income population and the area of living and living standards were indicative of the socioeconomic status of the participants. Among 1005 participants, 813 (81%) were living in nuclear families. The rest were living with their grandparents, paternal uncles and aunts. Only 2% (20) participants reported the involvement in sports and regular physical exercise.

Table-3 Common practices of women during menstruation

Hygiene*	N=1001
Cloth	N=423 (42%)
Sanitary napkins	N=578 (58%)
Use of OTC medication	N=323 (32%)
Paracetamol (Panadol)	N=120 (37%)
Mefenamic acid (Ponston)	N=158 (49%)
Ibuprufen (Brufen)	N=45(14%)
Remedy for UTI	N=573 (57%)
Personal Hygiene	N=80 (14%)
Home based Remedies	N=178 (31%)
Get prescription (antibiotics)	N=304 (53%)

p values for association btw hygiene and UTI (<0.001), hygiene and abnormal discharge (0.268)

DISCUSSION

Our study concluded that 62% of the participants had experienced menarche between the age of 12 and 14 years with mean age at menarche to be 12.5 (SD= 1.21) years. This finding is in line with a previous study where mean age at menarche was reported to be 12.92 (SD 1.41) [10]. Another study conducted in the urban squatter settlements reported that 82.8% of their participants experienced menarche between the age of 12 and 14 [7, 15] which further supports the range of the age at menarche reported in our study. However, a study undertaken in the urban middle-income class, in India [22] reported a higher age at menarche for their study-population with mean age of 13.51 (SD=1.04). The same study reported that age at menarche was lower in urban population when compared with their rural counterparts. Zahradnik et al. reported that age of menarche has impact on the number of menstrual cycle women experience in life time [16].

Our study has concluded a statistically significant association between age at menarche and BMI. In our study, 58% of the participants had normal BMI (18.5 to 24.9), whereas 19% had low BMI (16.1 to 18.49). There is evidence showing that BMI of females is associated with their age at menarche. Our study has determined that early menarche is associated with lower BMI in adulthood. There are studies suggesting that socioeconomic status influences the age of menarche in the population and that overweight girls experience menarche at an earlier age [1, 6, 9, 10, 17-19]. A study by Hakeem R. 2001, concluded that the prevalence of both underweight and overweight is highest among 19-40 years old females in low income class compared to the middle income class [11].

Our study reported a statistically significant association between hygienic practices and the incidence of urinary tract infections. A similar study undertaken in the lower-middle income settlements in Karachi concluded that those participants belonging from educated background used hygienic material more so than the ones with no education who reused old cloth after washing without properly drying it, a practice which enhances the chances in females of contracting UTIs [7].

Our study showed that majority (57%) of the participants reported abnormal discharge in between their cycles. Abnormal discharge that is neither colourless nor odourless could be indicative of a recurrent UTI that needs to be taken care of immediately either by improving hygiene or by visiting primary healthcare.

The affordability of hygienic material, such as sanitary napkins, has been associated with low socioeconomic status. However, the affordability is not the sole issue, rather the education on the maintenance of hygiene plays crucial role in decreasing incidents of UTIs. A systematic review on the diagnosis of UTIs in women reported that UTIs were among the most common bacterial infections seen in women visiting primary care in the United States [21]. A study conducted in the urban areas of Pakistan has concluded that women with higher education were more likely to observe good hygiene practices compared to those with no formal education [10]. Studies have reported that some girls used 1-3 pads daily while some used 5-8 pads daily [3, 22]. Prolonged usage of a sanitary napkin or old cloth can also promote bacterial and fungal growth thereby causing UTIs in females.

There were 72% of the participants in our study who reported dysmenorrhoea. This finding is falling within the range of 16-91% reported by a systematic review on dysmenorrhoea [16]. A study conducted in India, reported that 56.16% of their study population experienced dysmenorrhoea [2]. Studies undertaken on dysmenorrhoea reported that primary dysmenorrhoea (PD) is often associated with a higher age as the early cycles are anovulatory whereas PD is associated with ovulatory cycles only [16]. However, our study did not find any association with age and dysmenorrhoea. A study has reported that PD was more frequent with irregular cycles (2).

Analgesics were used by 32% of the females in our study. This finding is less than the one reported by a Turkish study, where 56.6% of the adolescent girls practiced self-medication whereas an Indian study reported just 7.13% of their population to be practicing self-medication [2, 6]. It has already been established that analgesics are only used to relief PD, however, most of the females in our study using analgesics for menstrual pain had never had themselves diagnosed for PD. Therefore, it was difficult to report whether they had PD or secondary dysmenorrhoea in which the later requires specific treatment. A study by Zahradnik et al. reported that PD influenced an individual's tolerance to pain and disturbs sleep and that many women who experience PD do not seek medical advice. This is very unfortunate as PD affects the quality of life and results in lost work days and absenteeism from work or school [16].

The limitation of this study was that the recruitment of participants was done on the basis of area of residence and not on the annual income of the households. Thus, it cannot be assured that all the participants belonged to the same socio-economic background. The city of Karachi has been unique in terms of the diversity of its population. Many have had migrated from different other parts of the country to settle in Karachi so they were in the middle of the transitioning from rural to upper income class. Therefore, the practices undertaken by such participants are coming from their previous background and not reflective of the urban upper-middle income society of the country. The surveyors had to assist the individuals in filling out the forms which could have introduced some bias. The age of menarche could be subject to memory recall bias.

CONCLUSION

Our study concluded statistically significant associations between age at menarche and BMI in the upper-middle income women in Pakistan. Our study also found significant association between hygiene practices and UTIs. These findings warrant further health promotion policies to improve nutritional and hygiene status among the female population of the country.

A comparative study in future should be undertaken between the practices among middle and lower income classes. Schools should launch educational programs to promote female health and hygiene. The trend of self-medication among adolescent females should be discouraged.

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