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Original Article

Epidemiology of dysmenorrhea among workers in Upper Egypt; A cross sectional study

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ABSTRACT

Objective: To investigate the epidemiology of dysmenorrhea amongst women in two textile factories in Beni-Suef, Egypt compared to non-working controls.
Study design: A cross sectional study.
Setting: Beni-Suef, Egypt.
Materials and methods: The study was conducted on 554 working women in two textile factories in Beni-Suef and 1081 non-working women, matched for age and residence. A structured questionnaire was used and a team of data collectors interviewed the women. The questionnaire included questions about the socio-demographic characteristics of women, history of dysmenorrhea during the past 12 months, associating symptoms, pain relief methods, and sources of information.
Results: The study reported higher rates of dysmenorrhea during the past 12 months (94.6%) amongst the working women, compared to their controls (90.7%) ($p < 0.05$). Backaches, generalized aching and nervousness were the most likely symptoms reported with menstruation72.2%, 56.3% and 41% respectively. More than half of the working women who experienced dysmenorrhea reported drinking herbal fluids and taking analgesics to alleviate their symptoms, while 43% had to take sick leaves due to their condition. Women in the study group resorted mostly to family members to get information about menstruation and menstrual disturbances.
Conclusions: Dysmenorrhea is highly prevalent among women working in the textile factories in Beni-Suef. Further research should focus on the adaptive strategies used by women to avoid the negative impacts of dysmenorrhea. Structuring occupational health programs that handle the menstrual disorders amongst the working women, especially in the industrial settings, should be considered.

1. Introduction

Dysmenorrhea, usually referred to as painful menstruation, is defined as a painful, cramping sensation hitting the lower abdomen. It is often accompanied by other symptoms, such as generalized aching, backaches, headache, anorexia, vomiting, nervousness, and breast tenderness, all occurring just before or during the menses [1].

Several risk factors have been linked to dysmenorrhea including hormonal disturbance, exposure to chronic stress, vitamin deficiencies, smoking, unhealthy dietary habits and physical inactivity [2–4].

Previous national and international literatures have investigated the epidemiology of dysmenorrhea in adolescent girls and concluded substantial variations in the incidence of dysmenorrhea [5–11]. However, few studies have explored dysmenorrhea in working women and investigated the relatedness of this condition to industrial work [12–14].

Being a debilitating condition for many women, dysmenorrhea boosts a major negative impact on the females' quality of life, their productivity at work, and healthcare utilization. Dysmenorrhea is associated also with high rates of absenteeism and restriction from regular activities. As a result, dysmenorrhea is responsible for recognizable economic losses attributed to the costs of medications and healthcare, in addition to the decreased productivity [12–15].

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The physical problems and the financial losses caused by dysmenorrhea are opposed by a limitation in our knowledge regarding the magnitude of the condition among the working females in Egypt, especially those working in industrial settings, which obstacles developing suitable occupational health programs. In this regards, the objective of this study is to investigate the incidence of dysmenorrhea in women working in two textile factories in Beni-Suef, Egypt, compared to non-working women.

2. Materials and methods

In this cross sectional study, all women working in two textile factories in Beni-Suef were invited to participate in the study conducted in the period between December 2016 and March 2017. Only women who were employed for more than one year, younger than 25 years, had no history of pelvic operations, and were not using hormonal contraceptives by the time of the study were allowed to participate. Of the 718 females working in the two textile factories, 554 females were found eligible and participated in the study. Then, we recruited 1081 women, not having work by the time of the study and matching the study group for age and residence, to serve as controls.

The sample size was determined using Epi-Info version 7 Stat Calc, [Center for Disease Control (CDC), WHO], based upon the following criteria; dysmenorrhea rate of 75%, confidence level of 90%, margin of error of 5% and non-response rate of 40%.

All the women who participated in the study, whether in the study group or the control group, were briefed of the purpose of the study with confirming confidentiality of data. The study was approved by the Research Ethics Committee of the Faculty of Medicine, Beni-Suef University.

Data were collected by a trained team of medical students with a supervisor from the Public Health Department using an interview questionnaire. The questionnaire included three sections:

Section I: Included questions about the socio-demographic characteristics, gynaecological age (Calender age minus menarche age), physical activity, sleeping hours, exposure to smoking, in addition to questions about the length of menstrual cycle and usage of hormonal contraceptives.
Section II: Had questions about whether the women experienced dysmenorrhea during the past 12 months, and the associating clinical symptoms during the same period.
Section III: Questioned about the pain relief methods used by the women who had dysmenorrhea, and if they had to take sick leaves for their complaints. This section included also a question about the main sources of information women resorted to for getting knowledge about menstruation.

The questionnaire was tested for reliability and the Cronbach's alpha was 0.72, while content validity was assessed by a professor of public health and a professor of gynecology and obstetrics.

Data were analyzed using the software, Statistical Package for Social Science (SPSS Inc. Released 2009, PASW Statistics for Windows, version 18.0: SPSS Inc., Chicago, Illinois, USA). Frequency distribution as percentage and descriptive statistics in the form of mean and standard deviation were calculated. Chi-square, *t*-test and correlations were done whenever needed. P values of less than 0.05 were considered significant.

3. Results

The mean age of the women in the study group was 21.6 ± 1.8 (18–25) years and that of controls was 21.6 ± 1.8 (17–25) years, and most of the participants in both groups (74% in study group and 71.2% in control group) were residing rural areas, with no statistically significant differences between both groups regarding their age or residence (Table 1).

Almost 30% of the women in the study group were married compared to only 5.7% of the control group ($p < 0.05$). Women in the study group were more likely to have illiterate fathers ($p < 0.05$), but the educational level of their mothers showed no differences from their controls ($p > 0.05$) (Table 1).

Compared to their controls, the working women in our study reported recognizably less hours of sleep (7.6 ± 1.4 h/day in the study group versus 8.3 ± 1.7 h/day in the control group) ($p < 0.05$), and more exposure to smoking, however statistically insignificant ($p > 0.05$). Gynaecological age and length of the menstrual cycle did not show considerable differences between both groups ($p > 0.05$) (Table 1).

When the working women and their controls were asked if they had experienced dysmenorrhea throughout the past 12 months, the incidence of dysmenorrhea among women in the study group was statistically higher than their controls, 94.6% and 90.7%, respectively ($p < 0.05$).

Among the working women, 72.2% reported backaches, 56.3% generalized aching, 41% nervousness, 37.9% had acne or flushing, and 30.7% had headaches. Insomnia abdominal distension and dysuria were the least reported complaints by the women in the study group 12.5%, 11.7% and 9.6%, respectively (Table 2).

For women in the study group who experienced dysmenorrhea, drinking herbal fluids and taking analgesics were the most widely used pain relief methods. Heating pads, rest and exercise were tried by few numbers of women. What is really worth pointing out is that 238 (43%) of women who complained of dysmenorrhea had to take sick leaves at least for one day due to their condition (Table 3).

When the working women were questioned about their sources of information about menstrual cycle and disorders, 65.9% reported family members, 24% friends, 14.6% educational institutions, 14.6% TV and social media, and only 6.9% had to ask doctors or nurses.

4. Discussion

Dysmenorrhea comes on the top of the most common gynaecological disorders worldwide, making it a public health concern. In our study, 94.6% of the women working in two textile factories in Beni-Suef reported dysmenorrhea in the past 12 months. Our finding consists with a study conducted on adolescent girls attending nursing schools in Minia and stated a dysmenorrhea rate of 94.4% [10], but relatively higher than results from other national studies; 75% in Mansoura [8] and 66% [16] to 76.1% [9] in Assiut. Reports from international studies showed wide variations in dysmenorrhea rates from only 38.1% in Lebanon [11] and 44.4% in China [17] to 60% in Canada [18], 76% in the USA [19], and 85.1% in Ethiopia [20]. Such major differences could be attributed to many factors. For example, some of the national [8,9] and the international studies [11,19] explored dysmenorrhea among school or university students, making the mean age of their subjects significantly younger than ours. Makhlouf and Abdul Hameed [16], El-Gilany et al. [8], Weissman et al. [19], and Andersch and Milsom [21] reported higher rates of dysmenorrhea in older women.

In addition, women in our study were asked if they experienced dysmenorrhea throughout the past 12 months only, while other studies explored the same condition during different time spans [18–20]. Besides, our study showed that the women in the working group were more likely to be married. In Egypt, married women are often responsible for raising children, managing house issues in addition to many social and cultural burdens which put them in stressful situations most of the time. Exposure to stress is

Table 1
Comparison between females in the study group and the control group regarding their socio-demographic and gynaecological characteristics.

Characteristics		Study group n = 554	Control group n = 1081	P-value
Age (mean ± SD)		21.64 ± 1.76	21.58 ± 1.79	0.562
Residence	Urban	144 (26.0)	311 (28.8)	0.130
	Rural	410 (74.0)	770 (71.2)	
Married		154 (27.8)	62 (5.7)	<0.001
Father's Education	Illiterate	130 (23.5)	172 (15.9)	0.001
	Elementary	121 (21.8)	252 (23.3)	
	High	303 (54.7)	657 (60.8)	
Mother's Education	Illiterate	161 (29.1)	314 (29.0)	0.315
	Elementary	134 (24.2)	228 (21.1)	
	High	259 (46.8)	539 (49.9)	
Sleeping hours/day (mean ± SD)		7.55 ± 1.41	8.32 ± 1.68	<0.001
Exposure to passive smoking		277 (50.0)	500 (46.3)	0.083
Gynaecological age (mean ± SD)		8.21 ± 2.45	8.16 ± 2.39	0.471
Menstrual cycle duration (mean ± SD)		27.73 ± 9.04	27.97 ± 5.19	0.491

Table 2
Common complaints associated with menstruation during the past 12 months among females in the study group.

Complaints associated with menstruation	Study group n = 554 (%)
Backaches	400 (72.2)
Generalized aching	312 (56.3)
Nervousness/irritation	227 (41.0)
Acne/flushing	210 (37.9)
Headache	170 (30.7)
Breast tenderness	129 (23.3)
Anorexia/vomiting	90 (16.2)
Insomnia	69 (12.5)
Abdominal distension	65 (11.7)
Dysuria	53 (9.6)
Others	34 (6.1)

Table 3
Pain relief methods used by females in the study group to alleviate symptoms of dysmenorrhea during the past 12 months.

Pain relief methods	Study group n = 524 (%)
Herbal fluids	324 (61.8)
Drugs	322 (61.5)
Absence from work	238 (43.0)
Heating pads	34 (6.5)
Exercise	31 (5.9)
Rest	22 (4.2)

considered one of the most potential risk factors for dysmenorrhea [17]. Also, though statistically insignificant, women in the study group were more likely to be exposed to smoking. Females who smoke or being exposed to smoking may report more dysmenorrhea [17,22].

Nicotine is a vasoconstrictor and could reduce the endometrial blood flow [22]. Further, it has an anti-estrogenic effect [23]. Moreover, most of the females in our study were residing rural areas or came from rural origins, making them more vulnerable to be circumcised. The painful scars from circumcision side by side with the emotional stress from such intervention are thought to be risk factors for dysmenorrhea [20]. Furthermore, according to the eligibility criteria of our study, females who were using hormonal contraceptive methods were excluded. Hormonal contraception is suggested to be protective from dysmenorrhea [18,24]. Above all, the disagreement around the definition of dysmenorrhea, the psychological differences regarding pain perception and other cultural factors might introduce additive explanations for such wide variations in dysmenorrhea rates [25].

The results of the current study showed higher rates of dysmenorrhea amongst the working females compared to non-working females. In a prospective longitudinal study on Chinese women, working women had more dysmenorrhea [17]. Also, Christiani et al. [12] and Bergsio et al. [14] concluded occupational stress and high rates of dysmenorrhea in women working in industrial settings.

The working women in this study reported mostly backaches, generalized aching and nervousness as bothering symptoms associated with menstruation. Previous reports confirmed our findings and reported the same symptoms among women of different age groups and from different cultural backgrounds [8–12,16–21].

Also, the responses of the women who experienced dysmenorrhea within the past 12 months towards their condition were drinking hot and herbal fluids and taking analgesic medications. El-Gilany et al. [8] and Shrotriya et al. [5] found also the same results, however both studies recorded higher rates of resorting to relax and rest as methods for pain relief than the rates in our study. This could be explained by the fact that the study group in our study included working women only and 27.8% of them were married, which could prevent them from having rest.

More interestingly, 43% of the working women in our study had to take sick leaves during the past 12 months due to their dysmenorrhea. In accordance, Makhlouf and Abdul Hameed found that the working women in Assiut who experienced dysmenorrhea were more likely to take sick leaves [16]. Bergsio concluded that out of every three women with dysmenorrhea in Norway, one had to stay in bed at least for one day per month, and those who had to go to work despite their pain showed reduced capacity for work [13]. In a different study, Bergsio and colleagues stated that 30% of women working in industrial companies in Norway had been absent from work [14]. Further, dysmenorrhea was estimated to be the most important cause of time lost from work in the United States [26].

Regarding the sources of information about menstrual disorders, women in our study tended to select family members, which agree with previous studies [10,27,28]. Only 6.9% of the women in the current study selected doctors or nurses as sources of information. This may be due to the sensitivity of the issue of dysmenorrhea, especially in a conservative community like that of Beni-Suef, in addition to the rural background of most participants which adds some cultural complexities to this topic.

In conclusion, dysmenorrhea is a very common gynaecological problem that carries many physical consequences. Working

women experience more dysmenorrhea and dysmenorrhea is one of the main causes of absenteeism. Occupational health programs should be tailored to enhance females' knowledge about menstrual disorders.

Conflict of interest

The authors declare that they have no conflict of interest.

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