



Received: 24 April 2018
Accepted: 16 September 2018
First Published: 19 September 2018

*Corresponding author: Ma. Luisa Marván, Instituto de Investigaciones Psicológicas, Universidad Veracruzana, Mexico
E-mail: mlmarvan@gmail.com; fabiola.oc7@gmail.com; mmarvan@uv.mx

Reviewing editor:
Anne van Dongen, School of Psychology, University of New South Wales, Australia

Additional information is available at the end of the article

HEALTH PSYCHOLOGY | RESEARCH ARTICLE

Menarcheal timing, memories of menarche, and later attitudes toward menstruation

Ma. Luisa Marván^{1*} and Joan C. Chrisler²

Abstract: Objective: The purpose of the present study was to explore memories of menarche in a sample of 404 young adult Mexican women who had reached menarche on-time or earlier or later than their peers. Current attitudes toward menstruation were also assessed and compared to memories of menarche and menarcheal timing.

Methods: The study used both quantitative (Beliefs and Attitudes toward Menstruation scale; checklist items about menarche memories) and qualitative (responses to the sentence stem “My first period was...”) methods.

Results: Early maturers had the most negative memories of menarche and were most likely to believe that menstruation should be kept secret. Regression analyses showed that more positive emotional reactions to menarche are associated with more positive attitudes toward menstruation (i.e. pride, pleasant) in young adulthood, whereas more negative reactions are associated with more negative (i.e. secretive, shameful) attitudes in young adults.

Conclusions: Our findings suggest that education about physiological, psychological, and practical aspects of menstruation should be provided to girls at younger ages so that early maturing girls will be better prepared for menarche and will have more positive (or, at least, less negative) experiences with and emotional reactions to it.

Subjects: Development Studies, Environment, Social Work, Urban Studies; Behavioral Sciences; Education

ABOUT THE AUTHORS

Ma. Luisa Marván is a Mexican researcher in the field of Health Psychology. She belongs to the Academic Team “Psychology, Health and Society”, and her main interests are psychosocial variables related to women’s reproductive health.

Joan C. Chrisler is Professor of Psychology at Connecticut College, where she teaches courses on gender and health psychology. She edits the journal *Women’s Reproductive Health*.

The information in the current article is complementary with previous articles that they have published in many international journals and books. Although both authors have their own research projects in their respective countries, they have published together several articles about attitudes toward menstruation, one of which concerns the design of a questionnaire to measure these attitudes.

PUBLIC INTEREST STATEMENT

Menarche, the first menstruation, is a memorable event for most women, and it has a profound impact on girls’ lives. We explored memories of menarche in adult Mexican women, as well their current attitudes toward menstruation. Those women who reached menarche at an earlier age than their peers reported the most negative memories of menarche, and were most likely to believe that menstruation should be kept secret. Moreover, negative reactions to menarche were associated with more negative attitudes toward menstruation when women reached adulthood. We concluded that education about physiological, psychological, and practical aspects of menstruation should be provided to girls at younger ages so that those who reach menarche at an early age will be better prepared and will have more positive experiences with and emotional reactions to menarche.

| **Keywords: Menarche; attitudes; menarcheal timing; menstruation**

1. Introduction

Puberty is a developmental period in which hormonal, psychological, cognitive, and physical changes occur simultaneously. Unlike other gradual changes that accompany puberty, menarche is sudden and conspicuous, and it is considered the major landmark of puberty for girls. It is a memorable event for most women because it symbolizes the end of childhood, and it has a profound impact on girls' lives (Chang, Hayter, & Wu, 2010). Menarche demands several emotional and social adjustments, and the timing of its occurrence has a great influence on these adjustments (Allison & Hyde, 2013; Gaudineau, Ehlinger, & Vayssiere et al., 2010; Walvoord, 2010).

Age at menarche varies between women across different cultures, in fact some researchers who compared diverse ethnic groups in the US have found differences in age at menarche among them (Chumlea, Schubert, & Roche et al., 2003; Obeidallah, Brennan, & Brooks-Gunn et al., 2000). Rigorous comparisons between the results of different studies are difficult due to methodological issues. However, there are two studies in which the published data about age at menarche in different countries were analyzed. In both studies the earliest age of menarche was 12.0 and the latest was 16.1 or 16.2 years, but most of those data were obtained during the twentieth century (Parent, Teilmann, & Juul et al., 2003; Thomas, Renaud, & Benefice et al., 2001). The age at menarche was earlier in countries where people have the longest life expectancies, and it was related to better nutrition (Thomas et al., 2001).

Studies in several countries have shown a secular trend toward a reduction in the age at menarche in the twentieth century, which was more evident in developed countries, probably due to improvement in socioeconomic conditions (Papadimitriou, 2016). It seems that the trend toward earlier age at menarche has stabilized in the most developed countries (Papadimitriou, 2016), whereas it continues in others, such as Nigeria (Nwokocha, Chinawa, & Ubesie et al., 2016), South Korea (Lee, Kim, & Oh et al., 2016), China (Song, Ma, & Agardh et al., 2015), Poland (Sławińska, Ignasiak, & Little et al., 2012), Brazil (Diez-Castilho, Pinheiro, & Bento et al., 2012), Argentina (Rubinstein, Rahman, & Risso et al., 2017), and Mexico (Marván, Castillo, Alcalá-Herrera, & Del Callejo, 2016). According to a recent study conducted in the city of Xalapa, Mexico, where the present study was also conducted, the estimated mean age at menarche is 11.34 years (Marván et al., 2016). Earlier age at menarche can result in a gap between girls' biological and social maturity, which may be related to increasing rates of psychosocial adjustment difficulties among those with earlier age of menarche (Boden, Fergusson, & Horwood, 2011).

In addition to population trends, some girls experience menarche earlier or later than their peers. Although nutrition and genetics play an important role in age at menarche, psychosocial and environmental factors have also been associated with menarcheal timing. Menarche occurs at an earlier age among girls raised in stressful circumstances, such as father absence or stepfather presence (Jean, Wilkinson, & Spitz et al., 2011; Mendle et al., 2006), or sexual abuse (Mendle, Leve, Van Ryzin, Natsuaki, & Ge, 2011). Lower socio-economic status also has been associated with earlier age at menarche (James-Todd, Tehranifar, Rich-Edwards, Titievsky, & Terry, 2010), although racial differences have been shown (Braithwaite et al., 2009).

Regardless of the reason why a girl experiences early menarche, several authors have found that it has health and psychosocial consequences. Girls who reach menarche earlier than their peers also report higher levels of depressive and anxiety symptoms; substance abuse, as well as use of tobacco and alcohol use at an earlier age than their peers; self-harming behaviors; eating disorders; and psychological problems, such as low perceived health, body image concerns, and perceived unhappiness (Alcalá-Herrera and Marván, 2014; Deng, Tao, & Wan et al., 2011; Ha, Kim, & Choi et al., 2015; Kim, Choe, & Park et al., 2017; McNicholas, Dooley, McNamara, & Lennon, 2012), however, there is controversy about how long such problems persist. Ibitoye et al. (Ibitoye et al., 2017) recently conducted a

systematic review of the literature in low- and middle-income countries, and concluded that, as in high-income countries, early menarche is associated with early sexual initiation, early pregnancy and childbirth, and some sexually transmitted infections.

Greif and Ulman (Greif & Ulman, 1982) suggested that both early and late maturers may be viewed as “out of step” with their peers, thus a girl’s age at the time of menarche can be an important factor in determining her response to her own menarche. The authors concluded that this could either be an advantage or disadvantage, depending on the values of the peer group. Several studies have been conducted to show how menarcheal timing is related to attitudes toward or experiences with menstruation, but most of them were conducted with postmenarcheal girls during the last century. These studies showed that menarche was more difficult for early maturers, who reported a higher degree of worry about menstruation than did their peers (Koff, Rierdan, & Sheingold, 1982; Rierdan & Koff, 1985; Rierdan, Koff, & Stubbs, 1988; Ruble & Brooks-Gunn, 1982; Stubbs, Rierdan, & Koff, 1989). As far as we know, there are only two more recent studies of girls that show that early maturers, as compared with their peers, reported a higher anxiety level at menarche (Natsuaki, Leve, & Mendle, 2011); were more likely to have felt scared, worried, and sad at menarche; and endorsed secretive attitudes toward menstruation (Marván & Alcalá-Herrera, 2014).

McPherson and Korfine (McPherson & Korfine, 2004) conducted a study with college-aged women to explore the relationship between early and current menstrual experiences. First, participants answered a questionnaire about their menarcheal experience and about their preparation for menarche; then, those participants who fell in the upper or lower 25% of both measures were asked about their current menstrual attitudes, experiences, and behaviors. It was found that those women who had extremely negative early menstrual experiences reported more current negative menstrual attitudes than did women with more positive experiences. On the contrary, women who had extremely positive experiences reported more positive body image and better general health behaviors. Furthermore, Estanislau et al. (Estanislau, Hardy, & Hebling, 2011) conducted focus groups with women aged 21–51 years, and concluded that the way in which menarche was experienced may exert an impact on later women’s reproductive health, sexuality, and lifestyle behaviors. This is why we decided to carry out the present study with adult women; we also used a different methodological approach—the Natural Semantic Networks Technique (NSNT), which was developed to measure the psychological meaning of a target concept.

Psychological meaning focuses on the subjective reaction of people toward a specific concept, and it includes both affective-evaluative and referential-cognitive components. The NSNT is based on two postulates about how information is organized in semantic memory. First, there is an internal organization of information in long-term memory, where elements are organized in networks of related words. Second, all of the words in the network do not have the same importance in defining the concept, thus there is a distance among them (Figueroa, González, & Solis, 1981; Reyes-Lagunes, 1993; Valdéz-Medina, 2005). Although NSNT has not been widely used, it has been shown to be useful in the study of some reproductive health issues. Based on previous research, we expected that women who had reached menarche earlier than their peers would have the most negative memories of menarche, as well as the most negative current attitudes toward menstruation. Therefore, the objectives of this study were: a) to explore memories of menarche in adult Mexican women (18–26 years old) who reached menarche earlier, on-time, or later than their peers; b) to explore these women’s current attitudes toward menstruation; and c) to explore the relation between memories of menarche and current attitudes toward menstruation.

2. Method

2.1. Participants

We recruited a non-probabilistic sample of 404 middle-class Mexican women living in the city of Xalapa (capital of the state of Veracruz). They ranged in age from 18 to 26 years (mean age = 21.15 years). The inclusion criteria were that they had to know how to complete a survey

on-line, to have access to a computer with Internet availability, and to be between 18 (age of majority) and 26 years old. We established the last criterion because, according to previous research (Marván et al., 2016), the age at menarche in Mexico declined in women who were born in the 1990s, therefore we decided to limit the survey to women born in that decade. Most women were undergraduate students from a public university, and they were recruited by direct solicitation at various places on campus where students congregate. The rest of the participants were recruited in different places in the city, such as public parks, shopping centers, and residential streets.

Table 1 shows the socio-demographic characteristics of participants according to their menarcheal timing. We compared these data between early, on-time, and late maturers using one-way ANOVAs and chi square for goodness of fit tests to detect any imbalance between groups. There were no significant differences between groups, which were socio-demographically similar.

2.2. Measures

Participants were first asked for demographic data and at what age they had their first menstrual period. Then, they were presented with the following task and measures:

1) Participants were asked to complete the open-ended phrase “My first period was...” by giving at least five different words or phrases. Then, they were asked to rank their answers according to how well each described the participants’ memories about their first period. The task was based on the NSNT proposed by Figueroa et al. (Figueroa et al., 1981), modified by Reyes-Lagunes (Reyes-Lagunes, 1993), and validated by Valdez-Medina (Valdéz-Medina, 2005). The NSNT is based on two postulates about how people organize information in their semantic memory. First, elements in long-term memory are organized in networks of words whose relationship reflects the psychological meaning of a particular concept (i.e. the subjective reaction toward a specific concept, which includes both affective-evaluative and referential-cognitive components). Second, the words in the network do not have the same importance, and there is some distance among them. Therefore, the NSNT requires people first to list words that define a concept (in this case, *menarche*) and then to rank them according to how close each word is to the concept under study. An advantage of this technique is that respondents answer spontaneously about the target concept instead of choosing among different possible

Table 1. Socio-demographic characteristics of participants. Data are given as mean and standard deviation or percentages

	Early maturers (n = 45)		On-time maturers (n = 300)		Late maturers (n = 59)	
	M	SD	M	SD	M	SD
Age menarche	9.62	.54	11.84	.74	14.42	.65
Current age	21.33	2.53	21.04	2.20	21.58	2.37
Occupation	n	%	n	%	N	%
Employed	13	29	75	25	16	27
Self-employed	12	26	72	24	15	25
Student	20	45	153	51	28	48
Educational level	n	%	n	%	N	%
High school or technical career	10	23	57	19	13	22
Undergraduate	20	45	150	50	28	48
College degree	14	32	93	31	18	30

responses devised by the researcher. This frees respondents to use all the meanings stored in their semantic memory that are associated with the target concept.

After that, participants completed the following instruments, which were presented in a counter-balanced manner.

2) An adapted questionnaire about memories of menarche, which has been used in previous studies (Marván & Alcalá-Herrera, 2014; Marván, Morales, & Cortes-Iniestra, 2006). First, participants were asked to check yes or no to each of the following questions about their experience of their first menstrual period: “I knew what was happening,” “I knew what I should do,” “I felt well prepared to start living with periods,” “I thought I should keep it a secret,” and “I thought I was not a girl anymore.” Next, participants were asked to check whether they had or had not experienced each of the following reactions at menarche: excited, ashamed, mature, scared, happy, sad, worried, and calm.

3) The Beliefs about and Attitudes toward Menstruation Questionnaire (BATM), which was developed in Mexico and validated in the US (Marván, Ramírez-Esparza, Cortés-Iniestra, & Chrisler, 2006). It contains 42 items rated on a 5-point Likert scale that ranges from 1 = disagree strongly to 5 = agree strongly. The BATM includes four subscales: a) Annoyance refers to the menses as a bothersome event, and includes items that suggest a desire to reject menstruation (e.g. “Men have a great advantage not having the annoyance of the period”). b) Proscriptions and Prescriptions includes some activities that women should not do and others that they should do while menstruating (e.g. “Women must take showers with hot water while we are having our periods”) or that reflect the belief that menstruation keeps women from their daily activities (e.g. “The period affects the performance of women at work”). c) Secrecy evaluates the importance of keeping menstruation a secret and feelings of embarrassment about menstruation (e.g. “It is uncomfortable for us women to talk about our periods”). Pleasant includes items about feelings of well-being and pride (e.g. “Women are proud when we start having our period”). The Cronbach’s alphas in the present study were: Annoyance .86, Proscriptions & Prescriptions .80, Secrecy .81, and Pleasant .75.

2.3. Procedure

The research protocol for this study was approved by the institutional review board of Universidad Veracruzana. A female researcher approached young adult women, either in different places of a public university or in public places in the city to ask them if they wanted to participate in a study about menstruation. They were told that the information they were going to provide would be anonymous. Upon agreement, they were asked to answer a few questions to determine whether they fulfilled the criteria for participation in the study; if they did, they were given a link to a survey posted on Survey Monkey.com. Participants clicked a button to provide their informed consent.

Participants were divided into three groups: early, on-time, and late maturers. In order to make this classification, we took into account both the median and mode of all participants’ age at menarche. In this way, the groups were formed according to age at menarche as compared to one’s peers.

3. Results

As result of the classification of the participants as described above, early maturers were those women who had reached menarche before 11 years ($n = 45$), on-time maturers were those who had reached menarche at age 11–13 years ($n = 300$), and late maturers were those who had reached menarche at 14 years or later ($n = 59$).

3.1. Memories of menarche

A thesaurus, in which closely related words were grouped together, was constructed to analyze the answers given to the open-ended phrase “my first menstruation was...” It was created and assembled by three people after they had read all of the responses. When there was disagreement as to how to group an answer, it was discussed until 100% agreement was reached on all

responses. Then, the following calculations were made: For each answer, the number of participants who ranked it in first place was multiplied by 10; in second place by nine; in third place by eight, and so on. All of these values were added to obtain a response's score. The 10 responses with the highest scores composed the *semantic network nucleus* (SNN). Finally, the *quantitative semantic distance* (QSD) of each of the responses that composed the SNN was calculated as follows: The main response was the one with the highest score and represented 100%. In order to determine the distance between the main response and the rest of the responses, we multiplied the score of each response by 100 and divided this result by the score of the main response to present the QSD as a percentage.

Table 2 shows the results of these analyses. The most important (first place) response given by early maturers was *scary*, which appeared in eighth place in the SNN of the on-time maturers with a QSD of 28%, but did not appear in the SNN of the late maturers. *Horrible* and *complicated* were responses that only appeared in the SNN of early maturers. By contrast, only the SNN of the late maturers contains responses with a positive connotation, such as *nice* and *calm*; however, the most important response they gave was *painful*. Both early and late maturers mentioned their age at menarche; on-time maturers did not.

Pearson chi-square tests were conducted to determine any association between menarcheal timing and the participants' responses to the questionnaire about memories of menarche. As can be seen in Table 3, fewer early maturers than on-time or late maturers stated that they had known what was happening and what they should do when they got their first menstrual period. Fewer early maturers felt well prepared to start living with periods, and the percentage of participants who thought that they should keep their first menstrual period a secret was higher in the group of early maturers.

The number of both positive and negative reactions that each participant acknowledged to have experienced was summed (yes=1; no=0). A one-way ANOVA with a Duncan posthoc test was conducted to compare the means of both positive and negative emotional reactions among the three groups of participants. There were no significant differences among the groups when positive reactions were compared; however, early maturers reported significantly more negative reactions to menarche than did on-time and late maturers, $F = 8.84 (2,402), p < .0001$ (Table 4).

Table 2. Answers to the phrase “My first menstruation was...” according menarcheal timing. The quantitative semantic distances (QSD) are presented

Early maturers		On-time maturers		Late matures	
Answer	QSD	Answer	QSD	Answer	QSD
Scary	100%	Confusing	100%	Painful	100%
Unexpected	59%	Annoying	88%	Confusing	98%
Confusing	57%	Strange	87%	Annoying	94%
Nerve wracking	30%	Unexpected	43%	Strange	49%
Embarrassing	29%	Dirty	42%	At certain age*	35%
Horrible	25%	Embarrassing	30%	Irregular	34%
Strange	24%	Painful	29%	Scarce	30%
Complicated	22%	Scary	28%	Nice	24%
Dirty	16%	Nerve wracking	26%	Calm	23%
At certain age*	13%	Red	22%	New	19%
* 10 or less years				* 14 or more years	

Table 3. Experience of menarche according menarcheal timing

	Early maturers <i>n</i> (%)	On-time maturers <i>n</i> (%)	Late maturers <i>n</i> (%)	χ^2	<i>p</i>
“I knew what was happening”	28(62.2%)	257(85.7%)	53(91.4%)	18.72	.001
“I knew what I should do”	23(51.1%)	224(74.7%)	49(83.1%)	14.46	.001
“I felt well prepared to start living with periods”	7(15.6%)	99(34.1%)	16(27.6%)	6.66	.04
“I thought I should keep it a secret”	20(44.4%)	82(27.3%)	12(20.3%)	7.77	.02
“I thought I was not a girl anymore”	10(22.2%)	134(44.8%)	26(44.1%)	9.21	n.s.

Table 4. Emotional reaction to menarche according menarcheal timing

	Early maturers		On-time maturers		Late maturers	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Positive reaction	0.71	1.29	0.96	1.15	1.05	1.80
Negative reaction	2.78 _{a,b}	1.26	2.11 _a	1.39	2.29 _b	1.48

Notes:^a Means within rows that share subscript letters are significantly different at $p < .05$

^b The possible values ranged from 0 to 4.

3.2. Current attitudes toward menstruation

The total scores for each BATM subscale were divided by the appropriate number of items. In this way, the total possible score for each subscale ranged from 1 to 5. A one-way ANOVA with a Duncan posthoc test was conducted to compare the means of each subscale among the three groups of participants. The only subscale in which there were significant differences was Secrecy. The Secrecy scores of early maturers were higher than the scores of both on-time and late maturers: $M = 2.32$, $SD = 1.04$; $M = 1.93$, $SD = 0.65$; and $M = 1.80$, $SD = 0.47$, respectively; $F = 8.28$ (2, 402), $p < .0001$.

In order to test whether responses to the questionnaire about memories of menarche were associated with current attitudes toward menstruation, we conducted four linear regression analyses. Each subscale of the BATM was entered as a dependent variable in each regression equation, and, in all cases, positive and negative reactions to menarche, as well as the other responses to the questionnaire about memories of menarche were the independent variables. The significant models were those in which memories of menarche were associated with the Secrecy ($\Delta r^2 = .31$, $F = 5.62$, $p < .0001$) and Pleasant ($\Delta r^2 = .27$, $F = 3.94$, $p < .0001$) subscales.

Negative reactions to menarche were associated with more secretive attitudes toward menstruation ($\beta = .16$, $p < .01$), as well as the belief that participants should keep secret the fact they had their first period ($\beta = .21$, $p < .0001$). On the other hand, positive reactions to menarche were associated with more pleasant attitudes toward menstruation ($\beta = .20$, $p < .0001$), as well as the fact that participants knew what was happening at the moment they experienced their first menstruation ($\beta = .11$, $p < .05$).

4. Discussion

The results of this exploratory study support those of previous researchers (Alcalá-Herrera and Marván, 2014; Allison & Hyde, 2013) that early maturing girls constitute a vulnerable population. That vulnerability might be because they did not understand the biology of the menstrual cycle, because they were

unprepared for menarche (e.g. mothers had not yet had “the talk” with their daughters), because they did not have the social support that going through the experience with their age-peers would provide, or some combination. This vulnerability could contribute to the negative attitudes toward menstruation and the reproductive shame that have been documented in young women (Grose & Grabe, 2014; Johnston-Robledo, Sheffield, Voigt, & Wilcox-Constantine, 2007, Roberts, 2004), as well as to sexual and reproductive health issues (Ibitoye et al., 2017) and mental health problems (Alcalá-Herrera and Marván, 2014; Deng et al., 2011; Ha et al., 2015; Kim et al., 2017; McNicholas et al., 2012) that have been documented in early maturers by previous researchers.

Previous research (Marván & Alcalá-Herrera, 2014; Stubbs, 2008) has shown that early maturers are more likely than others girls to be unprepared for menarche. This was true for our participants as well. The early maturers were less likely to know what was happening when they experienced menstruation for the first time, less likely to know what to do when their first menstrual period arrived, and more likely to believe that they should keep their experience secret. A girl who is less than 11 years old is still a “girl” in every other way, so it is not surprising that she would less ready than older peers to identify as an adolescent of reproductive age.

Girls who are unprepared for menarche have previously been found to have negative emotional reactions to the experience (Hoerster, Chrisler, & Rose, 2003; Stubbs, 2008). In our study, the early maturing girls had the most negative SNN. The most frequent word they used to describe their first menstrual period was *scary*. If girls are unprepared for menstruation, or were not expecting to experience it at such an early age, we can understand why they would be scared. They might worry that they are ill or injured. The words *horrible* and *complicated* appeared only in the early maturers’ SNN; *unexpected*, *embarrassing*, *dirty*, and *nerve-wracking* appeared only in the early and on-time girls’ SNNs. Late maturers had probably had time to learn about menstruation from typical sources (e.g. mothers, teachers, health care providers) and from their peers’ experiences. Therefore, their own experience was more ambivalent than negative; the late maturers were the only ones to have positive words in their SNN (*nice*, *calm*, *new*). Late maturers may find menstrual hygiene more simple than complicated, and menstruation more welcome than nerve-wracking, because of their readiness to identify as an adolescent and the opportunity to have seen peers’ adapt to their postmenarcheal status. Both early and late maturers mentioned age at menarche often enough to appear in their SNNs. Being early or late means that they are “out of step” with their peers (Greif & Ulman, 1982) and also might have caused them some worry, which, in the case of the late maturers, was resolved with the onset of the menstrual cycle. The words *confusing* and *strange* appeared in the SNNs of all three groups, which might refer to an effort it took to adjust to new bodily sensations related to menstruation and to changes in other people’s reactions to the array of pubertal changes in girls’ bodies.

Another of our findings was that negative emotional reactions to menarche were associated with current higher scores on the Secrecy subscale of the BATM. This scale includes items such as “It is embarrassing when a man finds out that a woman is having her period.” This and other items suggest that menstruation should be kept secret because it is shameful and too embarrassing to discuss. Negative attitudes toward menstruation and breastfeeding have been referred to as reproductive shame (Johnston-Robledo et al., 2007), and this shame can be traced both to cultural messages that menstrual blood is disgusting and to a scary or embarrassing experience at menarche. As early maturers had the most negative reaction to menarche, shame and fear might have played a role in their greater endorsement of secrecy.

In contrast, more positive emotional reactions to menarche were associated with higher scores on the Pleasant subscale of the BATM. This scale includes items such as “There are women who are happy every time they have their periods.” Scores on this subscale have been associated with higher scores on a measure of body appreciation (i.e. respect for the body and its functionality) (Chrisler, Marván, Gorman, & Rossini, 2015), which has also been shown to predict a positive body image (Tylka, 2011). Late maturers were the only group to have positive words in their SNN, although their overall

reactions were not significantly more positive than those of the on-time group. However, as it was shown in a recent study (Marván & Alcalá-Herrera, 2014), we can assume that late maturers might have been more “ready” for menstruation, thus at least somewhat more likely to feel pride, relief, and even happiness to have reached this developmental milestone.

4.1. Implications

The decrease in the mean age at menarche requires earlier education about sexuality and reproduction so that fewer early maturers will be unprepared for it. This will require changes to the school curriculum so that these topics are introduced earlier and presented in an age-appropriate manner so that menarche will not be as confusing, complicated, and nerve-racking for girls. Mothers have said that they find it difficult to talk to their daughters about menstruation (Cooper & Koch, 2007; Gillooly, 2004), often because their own mothers did not talk to them, so they have no model for a good conversation or believe they lack the knowledge to answer the questions their daughters might ask. Therefore, both mothers and daughters should be the subjects of educational intervention. Gynecologists and pediatricians can use regular office visits as targets of opportunity to initiate a discussion of menarche and offer to answer questions.

4.2. Limitations

The findings of this study should be interpreted in the context of their limitations, and some suggestions should be taken into consideration. First, the cross-sectional design limits conclusions; a longitudinal study would allow a better understanding of the directionality of associations. Second, as the survey was completed online, findings cannot be generalized to those who do not have access to the Internet or do not know how to use it. Moreover, all participants were attending the university or had attended the university, and we can infer that they belong to middle-income families. Mexican women with a more limited schooling or those living in rural areas often have different attitudes toward health and reproductive issues, and earlier studies have shown an association between SES and the timing of menarche. It is important that future researchers consider women’s social context. Third, we did not measure biological or psychological variables that are associated with the timing of menarche. It is important to include these variables in future studies, especially because several of them have also been related with risk behaviors, health behaviors, and psychosocial functioning.

4.3. Conclusion

This exploratory study showed that early maturers had the most negative memories of menarche, which were associated with more negative attitudes toward menstruation when they reached adulthood. Early maturing girls are a vulnerable population. Their vulnerability can be reduced, in part, by earlier education about sexuality and reproduction, including preparation for menarche. Sex education and health classes at school and talks with trusted adults (e.g. mothers, doctors, nurses) can ease fears and confusion related to the onset of menstruation. A more positive, or, at least, a less negative, emotional reaction to menarche could reduce reproductive shame, improve body image, and pave the way for better physical and mental health for girls and women.

Geolocation

Xalapa, the capital city of the state of Veracruz, is located near Mexico’s east coast, along the Gulf of Mexico. It is located 233 km northeast of Mexico City.

Acknowledgements

The authors wish to thank Fabiola Orihuela, who assisted them in the collection of data.

Funding

The authors received no direct funding for this research.

Author details

Ma. Luisa Marván¹
E-mail: mlmarvan@gmail.com

Joan C. Chrisler²

E-mail: jcchr@conncoll.edu

¹ Institute of Psychological Research, Universidad Veracruzana, Xalapa, Veracruz, Mexico.

² Department of Psychology, Connecticut College, New London, USA.

Citation information

Cite this article as: Menarcheal timing, memories of menarche, and later attitudes toward menstruation, Ma. Luisa Marván & Joan C. Chrisler, *Cogent Psychology* (2018), 5: 1525840.

References

- Alcalá-Herrera, V., & Marván, M. L. (2014). Early menarche, depressive symptoms, and coping strategies. *Journal of Adolescence*, 37, 905–913. doi:10.1016/j.adolescence.2014.06.007
- Allison, C., & Hyde, J. (2013). Early menarche: Confluence of biological and contextual factors. *Sex Roles*, 68, 55–64. doi:10.1007/s11199-011-9993-5
- Boden, J. M., Fergusson, D. M., & Horwood, L. J. (2011). Age of Menarche and psychosocial outcomes in a New Zealand birth cohort. *Journal of the American Academy of Child and Adolescent Psychiatry*, 50, 132–140. doi:10.1016/j.jaac.2010.11.007
- Braithwaite, D., Moore, D. H., Lustig, R. H., Epel, E. S., Ong, K. K., Rehkopf, D. H., ... Hiatt, R. A. (2009). Socioeconomic status in relation to early menarche among black and white girls. *Cancer Causes Control*, 20, 713–720. doi:10.1007/s10552-008-9284-9
- Chang, Y. T., Hayter, M., & Wu, S. C. (2010). A systematic review and meta-ethnography of the qualitative literature: Experiences of the menarche. *Journal of Clinical Nursing*, 19, 447–460. doi:10.1111/j.1365-2702.2009.03019.x
- Chrisler, J. C., Marván, M. L., Gorman, J. A., & Rossini, M. (2015). Body appreciation and attitudes toward menstruation. *Body Image*, 12, 78–81. doi:10.1016/j.bodyim.2014.10.003
- Chumlea, W. C., Schubert, C. M., Roche, A. F., Kulin, H. E., Lee, P. A., Himes, J. H., & Sun, S. S. (2003). Age at menarche and racial comparisons in US girls. *Pediatrics*, 111(1), 110–113.
- Cooper, S. C., & Koch, P. B. (2007). “Nobody told me nothin’”: Communication about menstruation among low-income African American women. *Women Health*, 46(1), 57–78. doi:10.1300/J013v46n01_05
- Deng, F., Tao, F., Wan, Y., Hao, J. H., Su, P. Y., & Cao, Y. X. (2011). Early menarche and psychopathological symptoms in young Chinese woman. *Journal of Women's Health / The Official Publication of the Society for the Advancement of Women's Health Research*, 20, 207–213. doi:10.1089/jwh.2010.2102
- Diez-Castilho, S., Pinheiro, C. D., Bento, C. A., Barros-Filho, A. D. A., & Cocetti, M. (2012). Tendência secular da idade da menarca avaliada em relação ao índice de massa corporal. *Arquivos brasileiros de endocrinologia e metabologia*, (2012(56)), 195–200. doi:10.1590/S0004-27302012000300008
- Estanislau, M. C., Hardy, E., & Hebling, E. M. (2011). Menarche among Brazilian women: Memories of experiences. *Midwifery*, 27, 203–208. doi:10.1016/j.midw.2009.05.008
- Figueroa, J., González, E., & Solis, V. (1981). Una Aproximación al Problema del Significado: Las Redes Semánticas [An approach to the problem of meaning: Semantic networks]. *Revista Latinoamericana De Psicología*, 13, 447–458.
- Gaudineau, A., Ehlinger, V., Vayssiere, C. (2010). Factors associated with early menarche: Results from the French Health Behaviour in School-aged Children (HBSC) study. *BMC Public Health*, 10, 1–7. doi:10.1186/1471-2458-10-1
- Gillooly, J. B. (2004). Making menarche positive and powerful for both mother and daughter. *Women Therapy*, 27(3–4), 23–35. doi:10.1300/J015v27n03_03
- Greif, E. B., & Ulman, K. J. (1982). The psychological impact of menarche on early adolescent females: A review of the literature. *Child Development*, 53, 1413–1430.
- Grose, R., & Grabe, S. (2014). Sociocultural attitudes surrounding menstruation and alternative menstrual products: The explanatory role of self-objectification. *Health Care Women International*, 35, 677–694. doi:10.1080/07399332.2014.888721
- Ha, J. Y., Kim, S. H., Choi, H. Y., & Ahn, Y. M. (2015). Early puberty is associated with psychological health problems in Korean adolescents. *ASTL*, 103, 227–231.
- Hoerster, K. D., Chrisler, J. C., & Rose, J. G. (2003). Attitudes toward and experience with menstruation in the US and India. *Women Health*, 38(3), 77–95. doi:10.1300/J013v38n03_06
- Ibitoye, M., Choi, C., Tai, H., Lee, G., Sommer, M., & Sear, R. (2017). Early menarche: A systematic review of its effect on sexual and reproductive health in low and middle-income countries. *PLoS ONE*, 12, e0178884. doi:10.1371/journal.pone.0178884
- James-Todd, T., Tehranifar, P., Rich-Edwards, J., Titievsky, L., & Terry, M. B. (2010). The impact of socioeconomic status across early life on age at menarche among a racially diverse population of girls. *Annals of Epidemiology*, 20(11), 836–842. doi:10.1016/j.annepidem.2010.08.006
- Jean, R. T., Wilkinson, A., Spitz, M. (2011). Psychosocial risk and correlates of early menarche in Mexican-American girls. *American Journal of Epidemiology*, 173, 1023–1210. doi:10.1093/aje/kwq498
- Johnston-Robledo, I., Sheffield, K., Voigt, J., & Wilcox-Constantine, J. (2007). Reproductive shame: Self-objectification and young women's attitudes toward their reproductive functioning. *Women Health*, 46(1), 25–39. doi:10.1300/J013v46n01_03
- Kim, H. S., Choe, B. M., Park, J. H., & Kim, S. H. (2017). Early menarche and risk-taking behavior in Korean adolescent students. *Asia-Pacific Psychiatry : Official Journal of the Pacific Rim College of Psychiatrists*, 9, e12273. doi:10.1111/appy.2017.9.issue-3
- Koff, E., Rierdan, J., & Sheingold, K. (1982). Memories of menarche: Age, preparation, and prior knowledge as determinants of initial menstrual experience. *Journal of Youth and Adolescence*, 11(1), 1–9.
- Las Redes, R.-L. I. (1993). Semánticas Naturales, su Conceptualización y su Utilización en la Construcción de Instrumentos [Natural Semantic Networks, their conceptualization and usage in the construction of instruments]. *Reviews Psicol Social Personal*, 9, 83–99.
- Lee, M. H., Kim, S. H., Oh, M., Lee, K. W., & Park, M. J. (2016). Age at menarche in Korean adolescents: Trends and influencing factors. *Reproductive Health*, 13, 121–130. doi:10.1186/s12978-016-0240-y
- Marván, M. L., & Alcalá-Herrera, V. (2014). Age at menarche, reactions to menarche and attitudes towards menstruation among Mexican adolescent girls. *Journal of Pediatric and Adolescent Gynecology*, 27(2), 61–66. doi:10.1016/j.jpag.2013.06.021
- Marván, M. L., Castillo, R. L., Alcalá-Herrera, V., & Del Callejo, D. (2016). The decreasing age at menarche in Mexico. *Journal of Pediatric and Adolescent Gynecology*, 29, 454–457. doi:10.1016/j.jpag.2016.02.006
- Marván, M. L., Morales, C., & Cortes-Iniestra, S. (2006). Emotional reactions to menarche among Mexican women of different generations. *Sex Roles*, 54, 323–330. doi:10.1007/s11199-006-9002-6
- Marván, M. L., Ramírez-Esparza, D., Cortés-Iniestra, S., & Chrisler, J. C. (2006). Development of a new scale to measure beliefs about and attitudes toward menstruation (BATM): Data from Mexico and the United States. *Health Care for Women International*, 27, 453–473. doi:10.1080/07399330600629658
- McNicholas, F., Dooley, B., McNamara, N., & Lennon, R. (2012). The impact of self-reported pubertal status and pubertal timing on disordered eating in Irish

- adolescents. *European Eating Disorders Review: the Journal of the Eating Disorders Association*, 20, 355–362. doi:10.1002/erv.2171
- McPherson, M. E., & Korfine, L. (2004). Menstruation across time: Menarche, menstrual attitudes, experiences, and behaviors. *Whi*, 14(6), 193–200. doi:10.1016/j.whi.2004.08.006
- Mendle, J., Leve, L. D., Van Ryzin, M., Natsuaki, M. N., & Ge, X. (2011). Associations between early life stress, child maltreatment, and pubertal development among girls in foster care. *Journal of Research on Adolescence: the Official Journal of the Society for Research on Adolescence*, 21(4), 871–880. doi:10.1111/j.1532-7795.2011.00746.x
- Mendle, J., Turkheimer, E., D'Onofrio, B. M., Lynch, S. K., Emery, R. E., Slutske, W. S., & Martin, N. G. (2006). Family structure and age at menarche: A children-of-twins approach. *Developmental Psychology*, 42(3), 533–542. doi:10.1037/0012-1649.42.3.533
- Natsuaki, M. N., Leve, L. D., & Mendle, J. (2011). Going through the rites of passage: Timing and transition of menarche, childhood sexual abuse, and anxiety symptoms in girls. *Journal of Youth and Adolescence*, 40, 1357–1370. doi:10.1007/s10964-010-9622-6
- Nwokocha, A. R., Chinawa, J. M., Ubesie, A. C., Onukwuli, V. I., & Manyike, P. C. (2016). Pattern of teen menstruation among secondary school girls in south east Nigeria. *Jpem*, 29, 343–350. doi:10.1515/jpem-2015-0257
- Obeidallah, D. A., Brennan, R. T., Brooks-Gunn, J., Kindlon, D., & Earls, F. (2000). Socioeconomic status, race, and girls' pubertal maturation: Results from the project on human development in Chicago neighborhoods. *Journal of Research on Adolescence: the Official Journal of the Society for Research on Adolescence*, 10(4), 443–464. doi:10.1207/SJRA1004_04
- Papadimitriou, A. (2016). The evolution of the age at menarche from prehistorical to modern times. *Journal of Pediatric and Adolescent Gynecology*, 29, 527–530. doi:10.1016/j.jpag.2015.12.002
- Parent, A. S., Teilmann, G., Juul, A., Skakkebaek, N. E., Toppari, J., & Bourguignon, J. P. (2003). The timing of normal puberty and the age limits of sexual precocity: Variations around the world, secular trends, and changes after migration. *Endocrine Reviews*, 24, 668–693. doi:10.1210/er.2002-0019
- Rierdan, J., & Koff, E. (1985). Timing of menarche and initial menstrual experience. *Journal of Youth and Adolescence*, 14(3), 237–244.
- Rierdan, J., Koff, E., & Stubbs, M. L. (1988). Timing of menarche, preparation, and initial menstrual experience: Replication and further analyses in a prospective study. *Journal of Youth and Adolescence*, 18(5), 413–426. doi:10.1007/BF02132777
- Roberts, T. A. (2004). Female trouble: The Menstrual self-evaluation scale and women's self-objectification. *Psychology of Women Quarterly*, 28, 22–26. doi:10.1111/j.1471-6402.2004.00119.x
- Rubinstein, A. V., Rahman, G., Rizzo, P., & Ocampo, D. C. (2017). Presentación de la menarca en madres e hijas. ¿Existe un adelanto? . *Acta Pediátr Mex*, 38, 219–227. doi:10.18233/APM38No4pp219-2271430
- Ruble, D. N., & Brooks-Gunn, J. (1982). The experience of menarche. *Child Development*, 53, 1557–1566.
- Śławińska, T., Ignasiak, Z., Little, B. B., & Malina, R. M. (2012). Short term secular variation in menarche and blood lead concentration in school girls in the copper basin of southwestern Poland: 1995 and 2007. *American Journal of Human Biology: the Official Journal of the Human Biology Council*, 24, 587–594. doi:10.1002/ajhb.22272
- Song, Y., Ma, J., Agardh, A., Hu, P., & Zhang, B. (2015). Secular trends in age at menarche among Chinese girls from 24 ethnic minorities, 1985 to 2010. *Global health action* (pp. 26929).
- Stubbs, M. L. (2008). Cultural perceptions and practices around menarche and adolescent maturation in the United States. *Annals of the New York Academy of Sciences*, 1135, 58–66. doi:10.1196/annals.1429.008
- Stubbs, M. L., Rierdan, J., & Koff, E. (1989). Developmental differences in menstrual attitudes. *The Journal of Early Adolescence*, 9, 480–498. doi:10.1177/0272431689094008
- Thomas, F., Renaud, F., Benefice, E., De Meeüs, T., & Guegan, J. F. (2001). International variability of ages at menarche and menopause: Patterns and main determinants. *Human Biology*, 73, 271–290.
- Tylka, T. L. (2011). Positive psychology perspectives in body image. In T. F. Cash & L. Smolak (Eds.), *Body image: A handbook of science, practice, and prevention* (pp. 56–64). New York: Guilford.
- Valdéz-Medina, J. L. (2005). *Las Redes Semánticas Naturales, Uso y Aplicaciones en Psicología Social* [Natural Semantic Networks, Use and Applications in Social Psychology] (4th ed.). México, D.F.: Universidad Autónoma del Estado de México.
- Walvoord, E. (2010). The timing of puberty: Is it changing? Does it matter? *Journal Adolescent Health*, 47, 433–439. doi:10.1016/j.jadohealth.2010.05.018



© 2018 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

Share — copy and redistribute the material in any medium or format.

Adapt — remix, transform, and build upon the material for any purpose, even commercially.

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

No additional restrictions

You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



Cogent Psychology (ISSN: 2331-1908) is published by Cogent OA, part of Taylor & Francis Group.

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com

