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## The Prevalence and Impact of Dysmenorrhea in Young Women within the United States

Annika Johnson Campbell

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The Prevalence and Impact of Dysmenorrhea in Young Women within the United States

by

Annika Johnson Campbell

Presented to the faculty of the  
Graduate School of Clinical Psychology

George Fox University

in partial fulfillment

of the requirements for the degree of

Doctor of Psychology

in Clinical Psychology

Newberg, Oregon

May 2019

# DYSMENORRHEA

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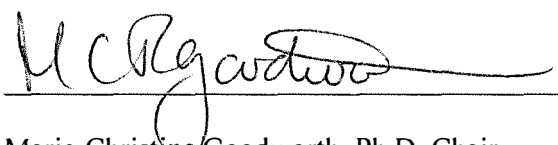
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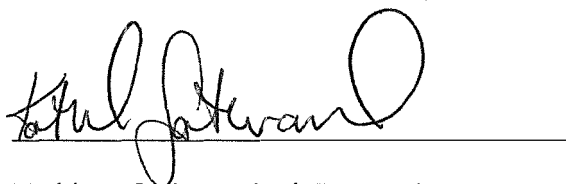
George Fox University

As a Dissertation for the PsyD degree

Signatures:



Marie-Christine Goodworth, Ph.D, Chair



Kathleen Gathercoal, Ph.D, Member



William Buhrow, PsyD, Member

Date: 11-29-18

# The Prevalence and Impact of Dysmenorrhea in Young Women within the United States

Annika Johnson Campbell

Graduate School of Clinical Psychology

George Fox University

Newberg, Oregon

## Abstract

International research suggests dysmenorrhea is a common problem among young adult women, with a significant impact on their daily functioning. However, limited research has been conducted on dysmenorrhea in young women in the U.S. The current study analyzed the prevalence, impact, and treatment of dysmenorrhea among 976 young adult women living within the U.S. Using a cross-sectional design, a questionnaire based on previous literature was created. It was then distributed to women between the ages of 18-28 through university email and participant initiated social media distribution. The mean age of participants was 22.27, 85% endorsed dysmenorrhea. Seventy percent of women rated their *average* menstrual cramping as moderate to severe on the Numeric Pain Rating Scale, and 70% endorsed experiencing at least one incidence of severe pain within the last 6 months. Moderate positive correlations were found between level of menstrual cramping and limitations in work around the home, physical activity, and social leisure activity. Additionally, 32% endorsed a moderate to severe impact on school. Despite high levels of pain, 49.4% of participants with dysmenorrhea had not discussed their symptoms with a healthcare provider within the last year. Forty-six percent of participants

indicated it was not at all helpful to speak to their healthcare provider about their menstrual cramping. Participants endorsed using an average of 4.75 treatment strategies for their menstrual cramping, a majority of which were home remedies. Greater pain was moderately correlated with more treatment strategies used. This study suggests moderate to severe dysmenorrhea may be highly prevalent in the United States amongst college educated young women. Moderate to severe dysmenorrhea effects daily activities, and yet is not likely to be discussed at length with healthcare providers.

*Keywords:* Dysmenorrhea, Menstruation, Menstrual Cramping, Women's Health, Healthcare communication

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## **Chapter 1**

### **Introduction**

Dysmenorrhea, otherwise known as painful cramping that occurs with menstruation, is the most common form of pelvic pain experienced by all women (Lacovides, Avidon, & Baker, 2015; Osayande & Mehulic, 2014). It is estimated between 45-95% of women suffer from dysmenorrhea (Proctor & Faruqhar, 2006). However, the prevalence rates of dysmenorrhea vary significantly due to the vast range of definitions and are suspected to be underestimates due to lack of documentation of the condition (Grandi et al., 2012; Ju, Jones & Mishra, 2013; Lacovides et al., 2015; Proctor & Faruqhar, 2006). There are two types of dysmenorrhea: primary dysmenorrhea (PD), where there is no known etiology for the pain, other than the production of uterine prostaglandins, and secondary dysmenorrhea (SD), where an underlying cause is present, most often endometriosis (Proctor & Faruqhar, 2006). However, the cause of pelvic pain is not what impacts the quality of life, rather it is the pain itself (Souza et al., 2011).

The onset of dysmenorrhea is typically one year after menarche, and peak prevalence occurs in the late teens and early twenties (Osayande & Mehulic, 2014). Several studies have found a positive correlation between dysmenorrhea and earlier menarche (Chia et al., 2013; Grandi et al., 2012; Ju et al., 2013). Additionally, young women who have not yet experienced live births tend to experience the most debilitating dysmenorrhea pain (Ju et al., 2013). In a review of the current literature, young women were found to have the highest prevalence of

dysmenorrhea, with an estimated range of 67 - 90% in ages 17-24 (Ju et al., 2013). However, most studies examining rates of dysmenorrhea have been conducted internationally.

The most recent studies conducted in the U.S. regarding the prevalence of dysmenorrhea in young women and how they managed their symptoms are longitudinal studies with data collection dating back to the 1980s (Harlow & Park, 1996; Weissman, Hartz, Hansen, & Johnson, 2004). The current statistics on dysmenorrhea for young women within the U.S. are limited, and as a whole, recent data on the prevalence of dysmenorrhea in women of reproductive age is sparse (Ju et al., 2013). However, international studies on university students suggest high prevalence. (Aktaş, 2015; Chia et al., 2013; Ju et al. 2013; Habibi, Soo Lee Huang, Ying Gan, Zulida, & Morteza Safavi, 2015; Lam & Charm, 2015; Ortiz, 2010; Unsal, Ayranci, Tozun, Arslan & Calik, 2010). Internationally, college aged women experience higher rates of dysmenorrhea and the most extreme and incapacitating cases of dysmenorrhea (Ortiz, 2010; Polat et al., 2009; Unsal et al., 2010). When looking at women 26 and younger, the estimates of debilitation increase to 41% (Ju et al., 2013). Within the university population in Italy 84% of participants reported menstrual pain, 55% reported menstrual pain and the need for medication, 31% reported menstrual pain and absenteeism, and 25% reported need for medication and absenteeism (Grandi et al., 2012). Within Turkey, 72.7% of students reported dysmenorrhea, and 66.2% described their pain as moderate to severe (Unsal et al., 2010).

### **Disease Burden**

Not only do many women experience the pain of dysmenorrhea, but they also experience the burden of disruption it has in their lives (Chia et al, 2013). When examining valid studies conducted on pelvic pain, dysmenorrhea caused a high disease burden (Latthe, Latthe, Say,

Gulmezoglu, & Khan, 2006). It is estimated one third of women accrue absences from work and school due to their debilitating dysmenorrheic pain (Grandi et al., 2012). The International Association for the Study of Pain (IASP) estimated 10-15% of women miss 1-3 days of work each menstrual period due to dysmenorrhea (IASP, 2007). Additional estimates range from 140 million to 600 million missed work hours per year due to dysmenorrhea within the US, and the estimated economic consequences at \$2 billion per year (El-Minawi & Howard, 2000; Ostrzenski, 2002). While examining dysmenorrhea within the US adolescent population, O'Connell, Davis, & Westhoff (2006) estimated at least 2 million teenage girls suffer from severe and debilitating dysmenorrhea. In Hong Kong one third of adolescent female participants reported experiences of debilitating dysmenorrhea (Chan, Yiu, Yuen, Sahota, & Chung, 2009). Outdated research suggests dysmenorrhea to be the leading cause for school and work absences for adolescent females (Ylikorkala & Dawood, 1978).

Internationally, women often experience negative impacts in their ability to concentrate, conducting their studies, physical activity, psychosocial well-being, sleep, daily chores, ability to leave the home, participation in sports and social events, and attending school or work (Chan et al., 2009; Chia et al., 2013; Grandi et al., 2012; Ortiz, 2010; Wong, 2011). When monitoring women with a history of dysmenorrhea using activity data loggers worn on the body, researchers found a 40% decrease in activity when participants were experiencing moderate to severe dysmenorrhea (Chantler, Mitchell, & Fuller, 2009). Additionally, there is a decrease in health-related quality of life amongst women suffering from dysmenorrhea (Lacovides et al., 2013; Unsal et al., 2010). Specifically, within western Turkey, dysmenorrhea had a 72.7% prevalence

rate amongst university females and it was found to have significant negative effects on the quality of life of the students (Unsal et al., 2010).

### **Involvement of Professional Healthcare**

Even though women face the burden of dysmenorrhea, they typically avoid medical involvement and do not discuss their symptoms with health care providers, even in severe cases (Aktaş, 2015; Berkley & McAllister, 2011; Chia et al., 2013; Lam & Charm, 2015; O’Connell et al., 2006; Ortiz, 2010; Proctor & Faruqhar, 2006). Many women consider menstrual pain to be normal, leading them to disregard their dysmenorrhea symptoms, and feeling as though it is “unworthy” of reporting to others (Berkley & McAllister, 2011; Ortiz, 2010). Additionally, many women overlooked the impact dysmenorrhea had on their lives (Chia et al., 2013). Another barrier in communicating with healthcare providers is women feeling like menstruation is too “embarrassing” to talk about (Chan et al., 2009). Recently, in Hong Kong, young adult women reported they were more likely to use the internet to find treatment for their dysmenorrhea than they were to discuss it with healthcare providers (Lam & Charm, 2015). These women preferred self-care strategies and turning towards the internet because it prevented them from having to engage in “embarrassing” conversations.

Women believing pain with menstruation is either normal or too “embarrassing” to discuss may lead to harmful neglecting of chronic health diseases, and many of these chronic health diseases may lead to problems with fertility (Osayande & Mehulic, 2014). Additionally, dysmenorrhea is often present in women who suffer from other pain conditions such as Irritable Bowel Syndrome, and Urinary Calculosis (Berkley & McAllister, 2011). Berkley and McAllistor

(2011) suggest treating dysmenorrhea may also assist in relief from these other co-morbid conditions.

## **Treatment**

Despite the high prevalence of dysmenorrhea, effective treatment methods remain under-researched (Ortiz, 2010). The first line of treatment for dysmenorrhea is nonsteroidal anti-inflammatory drugs (NSAID) to treat the pain (Daniels, Robbins, West, & Nemeth, 2009; Osayande & Mehulic, 2014; Proctor & Faruqhar, 2006). Research on adolescents within the US found nearly all the participants used prescription and over-the-counter (OTC) medications to treat their symptoms (O'Connell et al., 2006). Some used medications demonstrated as effective in dysmenorrhea such as NSAIDs, and some used medications with no proven benefit, such as acetaminophen, pamabrom, and narcotics. When used therapeutically, "Medications should be taken one to two days before the anticipated onset of menses and continued on a fixed schedule for two to three days." (Osayande & Mehulic, 2014, pp.344). The research findings are mixed regarding which NSAIDs are more effective in treating symptoms. Literature reviews have suggested OTC Naproxen may be most effective (Milsom et al., 2002).

Additionally, oral contraceptives may be used for preventing ovulation from occurring, however, the use of oral contraceptives in PD suggests limited evidence as to the effectiveness (Osayande & Mehulic, 2014; Ou., Hsu, Lai, Lin, & Lin, 2012; Proctor & Faruqhar, 2006). Recent studies have been conducted on the effectiveness of new treatments such as acupuncture, vibrating tampons, Vitamin K injections, essential oil massage, and therapeutic doses of vitamins and supplements such as Fennel, however, the evidence is limited to small random clinical trials (Chao, Callens, Wade, Abercrombie, & Gomolak, 2014; Witt, Strickland, Cheng, Curtis, &

Calkins, 2013). Additionally, exercise has often been thought to be beneficial in treating PD, however this research typically involves small sample sizes and questionable methodology, suggesting further research needs to be conducted on the effectiveness of exercise on PD symptoms (Daley, 2008).

Often, women prefer to self-manage dysmenorrhea, and notably, those who self-managed were more likely to experience inability to function in their daily activity (Ortiz, 2010). Self-treatment often involves using heat, hot beverages, and rest to treat their symptoms (Chia et al., 2013). For the women in Hong Kong turning to the internet for self-treatment strategies, they preferred more narrative sites such as blogs and forums, than medical oriented websites. The authors found this concerning due to the lack of peer review on sites such as these, which they state may lead to more problems than solutions (Lam & Charm, 2015).

### **Social Influence**

Chris Bobel, author of the book, *New Blood: Third-wave Feminism and the Politics of Menstruation*, explains how the women's health movement grew during the 1970s and 80s (Bobel, 2010). She describes how the medical system, which was both designed and run mostly by men, ignored and overlooked the bodily experiences unique to women, leading to failure to provide adequate women's health care. In regard to menstruation within Western societies women are instructed to keep their new status of "womanhood" a secret (Marván, Luisa, Morales, & Cortés-Iniestra, 2006). Bobel illuminates the powerful message distributed to young women regarding their bodies and their place in society, "It will do things that we need not speak of. You will relate to it primarily as a consumer." (2010, p. 27).

As Lorber states in the foreword of Bobel's book, "Menstruation was something to minimized, managed, and made invisible" (2010, p. xi). Another trend in the history of women's health is to trivialize their menstrual pain as "Just in their head" perpetuating the notion of instability in women (Bobel, 2010). In fact, up until the 21st century, the medical literature often ascribed pain during menstruation to emotional and psychological problems (Proctor & Faruqhar, 2006). Therefore, "women believed it may be unwise to focus on experiences that makes them different than men for fear they may be used against them" (Bobel, 2010, p. 29; Delaney, Lupton, & Toth, 1988). This view of women's menstrual pain may be a reason why dysmenorrhea has not been a focus in medicine.

### **Research Limitations**

Although it is known that dysmenorrhea has a high prevalence rate and a significant impact, it has remained largely ignored by those in the pain community (Berkley & McAllister, 2011). In Pubmed and Sciencedirect searches conducted in 2011 by Berkley and McAllister, they found 0.1% of "pain" papers acknowledged dysmenorrhea. Additionally, they note, "While 2988 grants in the USA received funds for "pain" research, only 15 have been funded for research that includes dysmenorrhea: 0.5% of pain research." (Berkley & McAllister, 2011, p. 1940). Furthermore, only limited information on dysmenorrhea was collected, excluding both severity and duration, and they stated, "The dysmenorrhea information has not been analyzed or reported." (Berkley & McAllister, 2011, p. 1940). As Laura Fingerson writes in *Girls in Power: Gender, body, and Menstruation in Adolescence*,

It is odd that such an integral and routine event in women's lives, which has significant implications for women's health and well-being over the life course,

not to mention the salience it holds in adolescence, has generally been ignored in social research (2006, p. 4).

Additionally, appropriate patient-reported outcome measures of dysmenorrhea symptoms and functional impact are currently lacking (Nguyen et al., 2017). Nguyen et al., found the Menstrual Symptom Questionnaire (MSQ; Chesney & Tasto, 1975), Moos Menstrual Distress Questionnaire (MDQ; Moos, 1968), Verbal Multidimensional Scoring Assessment for Dysmenorrhea (VMSAD; Andersch & Milsom, 1982), McGill Pain Questionnaire (MPQ; Melzack, 1975 & 1987) and Symptom Severity Scale (SSS; Biberoglu & Behrman, 1981) all to be lacking in sufficient evidence for content validity, citing reasons such as, “minimal concept coverage (SSS, MPQ), insufficient input from patients (VMSAD, MDQ), and items assessing multiple concepts (MSQ)” (Nguyen et al., 2017, p. 2041-2042).

### **Purpose of this Study**

This study surveyed young women living in the USA regarding their current symptoms of dysmenorrhea and the impact it has on their ability to function. It assessed the symptoms they experience during menstruation and the severity of their menstrual cramping and how it impacts their daily living. Additionally, information was gathered regarding the level of communication they have had with their healthcare providers and how they treat their dysmenorrhea symptoms. Due to the measurement limitations mentioned above, this study broadly surveyed women's experiences using questions developed by the researcher based on the previous literature (Aktaş, 2015; Chan et al, 2009; Chia et al, 2013; Grandi et al, 2012; Habibi et al., 2015; Ortiz, 2010; Unsal et al, 2010; Wong, 2011).



**Hypotheses**

The primary contribution of this study is to describe young women's experience of dysmenorrhea in the United States.

Hypothesis 1: The majority of women in this study will experience moderate to severe dysmenorrhea measured by the Numeric Pain Rating Scale (NPRS; McCaffery & Beebe, 1993).

Hypothesis 2: There will be a positive correlation between average menstrual cramping as measured by the NPRS and levels of impaired daily functioning as measured by the 8 function items on the modified Dysmenorrhea Daily Diary (DysDD; Nguyen et al., 2017).

Hypothesis 3: The majority of women will not have talked to their providers at length regarding their menstrual pain as measured by the item regarding discussing menstrual pain with the healthcare provider.

Hypothesis 4: Pain severity will be positively correlated with the total number of treatment methods used.

## **Chapter 2**

### **Methods**

#### **Participants**

Upon distribution, 1,067 participants started the survey. One hundred forty-four participants did not endorse pelvic pain or cramping with menstruation and were discontinued from the remainder of the survey. Eight hundred seventeen participants endorsed pelvic pain and cramping with menstruation and continued the survey. For questions towards the end of the survey fewer participant answers were recorded, such as questions on communication with providers. The sample size for each item will be listed for each descriptive statistic in the tables below. All participants identified as female, were between the ages of 18-28, and were living in the United States. The average age of participants was 22.27 ( $SD = 3.2$ ). The average completed grade level was 15.78 ( $SD = 2.4$ ). Of the participants, 75.4% identified as Non-Hispanic white, 8.5% as bi-racial, 6.2% as Latina/Hispanic American, 3.2% East Asian, 1.4% black, Afro-Caribbean, or African American, 1.1% Middle Eastern, 0.7% Native American, 0.5% South Asian, and 1.8% as “Other” (see Table 1) .

#### **Procedure**

Following IRB approval from George Fox University, the opportunity to participate in the current cross-sectional analytical survey was distributed to all undergraduate and graduate students at George Fox University via university email. Participants completed informed consent, responded to demographic items, provided general menstruation information, and

Table 1

*Demographics*

Variable	<i>n</i>	Percentage	M ( <i>SD</i> )
Age	965		22.27 (3.18)
Ethnicity			
Non-Hispanic White	735	75.4	
Latina/Hispanic American	60	6.2	
East Asian	31	3.2	
Black, Afro-Caribbean or African American	14	1.4	
Middle Eastern	11	1.1	
Native American	7	.7	
South Asian	5	.5	
Bi-racial	83	8.5	
“Other”	18	1.8	
Grade Level	962		15.78 (2.37)

disclosed whether or not they had experienced symptoms of dysmenorrhea in the last six months (see Appendix A for informed consent). Those who did not endorse dysmenorrhea symptoms were discontinued from the remainder of the survey. Those who did endorse dysmenorrhea symptoms then completed the remainder of the survey regarding impact on functioning, treatment strategies, and communication with healthcare providers. Upon completion of the survey all participants were given the opportunity to be placed into a drawing for 20 ten-dollar gift certificates to Amazon. Students who received the survey via university e-mail shared the link on social media. Although the original intention was to gather an accurate response rate, once the survey link was widely shared by students, the investigator decided to invite

participation through the Society for Menstrual Cycle Research listserv. Diva Cup International contacted the researcher and requested to further distribute the survey link via their social media platform. A majority of participants, 68.6%, endorsed hearing of the survey through the university setting and email, and 30.8% through social media or a friend.

## Measures

Participants responded to survey questions regarding demographic characteristics, menstrual and dysmenorrhea symptoms, ability to function during dysmenorrhea, methods of treatment for dysmenorrhea, communication with healthcare providers regarding dysmenorrhea, and previous reproductive diagnoses (see appendix B for survey). Given the difficulties with finding validated and reliable measures for this population, the primary questionnaire used in this study was created based on previous studies in the literature (Aktaş, 2015; Chan et al, 2009; Chia et al, 2013; Grandi et al, 2012; Habibi et al., 2015; Ortiz, 2010; Unsal et al, 2010; Wong, 2011). The survey, which consisted of 34 questions, was piloted on a group of university women. Additionally, public health personnel were consulted regarding survey content and layout.

**Menstrual Pain Measure.** The definition of dysmenorrhea used in this study was consistent with the current literature, including pain in the lower abdomen, back, and/or thighs associated with menstruation and may be accompanied by nausea, vomiting, diarrhea, and fatigue (Lacovides et al., 2015; Osayande & Mehulic, 2014; Proctor & Faruqhar, 2006). The intensity of menstrual pain and cramping was assessed according to the Numeric Pain Rating Scale (NPRS), a numeric VAS (Visual Analogue Scale) with integers 0-10. Zero was considered *no pain*, 1-3 considered *mild*, 4-6 *moderate*, and 7-10 *severe* (McCaffery & Beebe, 1993). In

other pain populations, the NPRS has a test retest reliability of .96 and .95 respectfully (Ferraz et al., 1990).

**Measure of Impact on Functioning.** Modified items from the DysDD were used to assess the impact of menstrual cramps on functioning in participants who had experienced dysmenorrhea within the past six months (Nguyen et al., 2017). The reliability of the original full DysDD within one menstrual cycle was adequate (weighted kappa: 0.5-0.7). The measure showed concurrent validity, however, reliability between cycles varied (Nguyen et al., 2017). In this study, select items on functioning were utilized such as, “In the past 6 months, how much did pelvic pain or cramping during menstruation limit you in your physical activity?”

## Chapter 3

### Results

#### Menstruation

This study was conducted with 976 female participants. The number of missing values ranged from 0-11 and the mean was 2.17 ( $SD = 4.27$ ). A correlation was conducted between average menstrual cramping and total number of missing values. The correlation was not significant,  $r = .03$ ,  $p = .45$ . Therefore, there was no pattern to the missing values related to their menstrual cramping pain. Because the sample size was sufficiently large, missing values were not replaced. Additionally, the survey consisted of single item questions and no totals or averages of any validated measures were computed further supporting the decision not to replace missing values in a iterative linear interpolation.

Characteristics of the participants' menstrual cycles are displayed in Table 2. The mean age of menarche was 12.34 ( $SD = 1.64$ ). Age of menarche had a significant inverse correlation with menstrual cramping. The correlation relationship was strong indicating earlier menarche onset was related to higher menstrual cramping,  $r = -0.87$ ,  $p = .015$ . The average period length for participants was 5.29 days ( $SD = 1.64$ ). Of the participants, 81% reported moderate to heavy bleeding during menstruation. Only 7.1% of participants endorsed a history of childbirth.

When thinking back on the last six months, abdominal cramping was the most frequently endorsed symptom during menstruation, with a prevalence of 91.9% ( $n = 968$ ), participants categorized their level of cramping 24.6% *mild*, 41.3% *moderate*, and 26% as *severe* when using terminology. Other common co-occurring symptoms were bloating, tension/irritability/mood

swings/crying spells, backache, swollen or tender breasts, appetite changes, and other various symptoms presented in Table 3. Using a 0-10 rating scale, 71% of participants rated their overall menstrual discomfort, including all symptoms, a 5 or higher (Item 12).

Table 2

*General Menstruation Information*

Item	<i>N</i>	<i>M (SD)</i>
Age of Menarche	962	12.34 (1.64)
Number of Periods in the last 6 months	963	5.39 (1.43)
Average duration of menstruation (days)	967	5.29 (1.64)

**Dysmenorrhea**

Eighty-five percent endorsed any degree of cramping or pain in the pelvic area along with menstruation (Item 13). Those who did not endorse pelvic pain or cramping were discontinued from the survey. Using the Numeric Pain Rating Scale of 0-10, 70.1% of participants rated their average menstrual cramping as a 5 or higher, with an average of 5.39 ( $SD = 2.05$ ) (Item 14). Therefore, Hypothesis 1 was verified with a majority of women endorsing moderate to severe dysmenorrhea. When rating their worst menstrual cramps in the last six months on the same scale, 69.7% rated their worst pain as a 7 or higher, with an average of 7.38 ( $SD = 2.13$ ) (Item 15). On average, participants reported 2.15 days ( $SD = .85$ ) of cramping during each period over the last 6 months. Demographic variables were considered to assess differences in menstrual cramping. Because the majority of the sample received the survey through university e-mail, and were college educated and living in the Pacific Northwest the only demographic variable

Table 3

*Symptoms with Menstruation*

Symptom	<i>n</i>	% None	% Mild	% Moderate	% Severe
Feeling Tired	965	8.6	25.4	44.2	21.8
Trouble Sleeping	958	44.6	26.9	18.6	9.9
Trouble with Concentration and Memory	960	54.2	27.4	14.3	4.2
Tension, Irritability, Mood Swings, Crying Spells	965	15	31.6	35.4	17.9
Anxiety	962	31.1	29.6	26.5	12.8
Depression	961	42.4	28.2	21.2	8.2
Abdominal Cramping	968	8.1	24.6	41.3	26
Joint/Muscle Pain	960	36.1	31.5	27.9	4.5
Leg Aches	958	58.2	22.4	15.8	3.5
Backache	963	24.5	28.8	33.1	13.6
Swollen or Tender Breasts	962	24.3	37.1	29.6	8.9
Upset Stomach/Nausea	960	37.4	30.8	23.0	8.8
Bloating	966	13.1	34.7	38.5	13.7
Constipation/Diarrhea	963	32.7	31	27.4	8.8
Headache/Migraine	959	37.6	29.1	23	10.2
Appetite Changes	960	25.6	32.8	31.6	10

analyzed was ethnicity. The sample was divided into white and non-white groups and the ANOVA was not significant  $F(1, 719) = .67, p = .41$ .

### Impact on Functioning

The impact of dysmenorrhea on functioning is displayed in Table 4. Means and standard deviations were based on a 5-point scale, ranging from 0 (*Not at all*) - 4 (*Extremely*). The area of functioning most impacted was physical activity with 52.9% of participants endorsing a



moderate to extreme impact. Work around the home was also impacted with 50.5% of participants endorsing moderate to extreme effects. Given the age range of the population surveyed, most of which were enrolled in university, 42.8% of participants endorsed a moderate to extreme impact on concentration, and 32.3% endorsed a moderate to extreme impact on school. Correlation coefficients were computed among pain and the 8 scales of function. Using a Bonferroni to control for type 1 error across the 8 correlations, a  $p$  value of less than .006 (.05 / 8 = .006) was required for significance. The results of the correlational analyses presented in Table 5 show that all 8 were statistically significant and were greater than or equal to .38, supporting hypothesis 2. Specifically, the relationship between the pain and its impact on work around the home, physical activity, and social leisure activity were all strong and greater than .52.

Table 4

*Impact on Functioning*

Item	<i>n</i>	Mean ( <i>SD</i> )	%Not at all	% Slightly	% Moder- ately	% Quite a bit	% Ex- tremely
Paid Work	793	.75 (.98)	53.6	26	13.2	5.7	1.5
School Work	796	1.07 (1.09)	39.6	28.1	20	9.9	2.4
Work around the Home	793	1.65 (1.17)	17.8	31.8	24.7	18.7	7.1
Physical Activities	783	1.67 (1.07)	13.7	33.5	29.6	18.4	4.9
Social and Leisure Activities	783	1.41 (1.08)	22.2	35	24.4	15.7	2.7
Relationships with Other	782	.94 (1.01)	42.3	30.7	18.7	6.6	1.7
Ability to Concentrate	783	1.38 (1.09)	23.1	36.7	23.4	12.9	4.0
Ability to Sleep	783	1.20 (1.11)	32.4	32.7	21.1	10.3	3.4

Table 5

*Correlation of Dysmenorrhea Pain and Functioning*

Variable	Average pelvic pain or cramps	Physical activities	Social or Leisure Activities	Relationships with others	Ability to concentrate	Ability to sleep	Paid work	School work	Work around the home
Average pelvic pain or cramps	1								
Physical activities	<i>n</i> = 795 .53**	1							
Social or Leisure Activities	<i>n</i> = 776 .56**	<i>n</i> = 783 .72**	1						
Relationships with others	<i>n</i> = 776 .39**	<i>n</i> = 783 .51**	<i>n</i> = 783 .63**	1					
Ability to concentrate	<i>n</i> = 775 .49**	<i>n</i> = 782 .56**	<i>n</i> = 782 .60**	<i>n</i> = 782 .54**	1				
Ability to sleep	<i>n</i> = 776 .49**	<i>n</i> = 783 .50**	<i>n</i> = 783 .52**	<i>n</i> = 782 .44**	<i>n</i> = 783 .58**	1			
Paid work	<i>n</i> = 776 .38**	<i>n</i> = 783 .46**	<i>n</i> = 783 .49**	<i>n</i> = 782 .49**	<i>n</i> = 782 .40**	<i>n</i> = 783 .39**	1		
School work	<i>n</i> = 792 .41**	<i>n</i> = 774 .47**	<i>n</i> = 774 .56**	<i>n</i> = 773 .40**	<i>n</i> = 774 .53**	<i>n</i> = 774 .41**	<i>n</i> = 793 .46**	1	
Work around the home	<i>n</i> = 795 .54**	<i>n</i> = 777 .62**	<i>n</i> = 777 .61**	<i>n</i> = 776 .47**	<i>n</i> = 777 .55**	<i>n</i> = 777 .46**	<i>n</i> = 793 .47**	<i>n</i> = 796 .52**	1
	<i>n</i> = 792	<i>n</i> = 774	<i>n</i> = 774	<i>n</i> = 773	<i>n</i> = 774	<i>n</i> = 774	<i>n</i> = 791	<i>n</i> = 793	<i>n</i> = 793

Note. \*Correlation is significant at the 0.01 level (2-tailed).

### Communication with Health Care Providers

Amongst the participants who endorsed dysmenorrhea, 49.4% of participants reported they have not discussed their menstrual cramps with their provider *at all* within the last year, with the average length of discussion a 2.97 ( $SD = 3.46$ ) on a 0 (*not at all*) - 5 (*briefly*) - 10 (*at length*) scale (Table 6). Hypothesis 3 was supported with 79.6% of participants endorsing their level of conversation with their healthcare provider as *Briefly discussed* or less. Of the participants, 7.8% had sought emergency care due to menstrual cramping. When rating their comfort discussing menstrual pain with their provider, 44.2% rated their comfort as moderate or below. On a 0 - 10 scale, 0 (*not at all helpful*), 5 (*neutral*), and 10 (*very helpful*), measuring how helpful it was to speak to their health care provider regarding their menstrual cramping 75.1% of women rated it a 5 or below, with 46.3% reporting it was not helpful at all to speak to their healthcare provider. Relevant diagnoses amongst the participants are displayed in Table 7.

Table 6

#### *Communication with Healthcare Provider*

Item	<i>N</i>	Mean ( <i>SD</i> )
Amount of Discussion with Healthcare Provider within the Last Year 0 (Not at all) - 10 (Discussed at Length)	773	2.98 (3.47)
Comfort Level Discussing Cramping with Healthcare Provider 0 (Not at all) - 10 (Very Comfortable)	771	6.5 (3.16)
Level of Help Discussing Cramping with Healthcare Provider Was 0 (Not at all) - 10 (Very Helpful)	774	3.32 (3.60)

Table 7

<i>Relevant Diagnoses</i>	
Diagnosis ( <i>n</i> = 976)	%
Endometriosis	1.5
Uterine Fibroids	.6
Polycystic Ovary Syndrome	4.7
Infection in the last 6 months	1.7
None	77.9

### **Treatment Strategies**

Treatment strategies endorsed by participants are presented in Tables 8-10. Showers and baths, NSAIDS, sleep, heat, and warm beverages were the most common treatment strategies used amongst participants. However, only 52% of women reported the use of NSAIDS to control pain. On average participants used 4.75 ( $SD = 3.54$ ) treatment strategies, and of those strategies 2.85 ( $SD = 2.25$ ) were home remedies. A correlation coefficient was computed between menstrual cramping and the total number of treatment methods used including home, alternative, and medical. Participants with higher pain endorsed using more treatment strategies, with a significant moderate sized correlation  $r = .31, p = .00$ . Therefore, hypothesis 4 was supported.

### **Additional Analyses**

The sample was divided into 4 quartiles based on average menstrual pain. The 1<sup>st</sup> and 4<sup>th</sup> quartile were compared to see if there were any differences between those with the lowest pain and those with the highest pain on the impact of pain on function (work, school work, physical activity etc.) and communication with healthcare provider. Independent samples *t* tests were conducted and were significant except for comfort level discussing menstrual pain with

Table 8

*Medical Treatment Strategies*

Treatment Method (n= 976)	%
Tylenol	33.9
Pamprin/Midol	18
NSAIDS	52
Narcotics	1.1
Contraception	20.3

Table 9

*Home Treatment Strategies*

Treatment Method (n = 976)	%
Warm Beverage	38.4
Sleep	50.6
Heat	48.1
Shower/bath	53.1
Exercise	30.5
TV/Distracton	36.7
Food or Drink	17.8
Alcohol	5.5
Marijuana	4.6

Table 10

<i>Alternative Treatment Strategies</i>	
Treatment Method ( <i>n</i> = 976)	%
Acupuncture	.8
Massage	14.7
Yoga	13.6
Postural Adjustment	20.4
Dietary/Nutritional Supplement	5.6
Herbal	8.7

healthcare provider (see Table 11). Effect sizes for the differences between these means were calculated. Effect sizes for all areas of function were very large, especially for social and leisure activities. There was a moderate difference between those with lowest pain and those with highest pain on discussing with health care provider ( $d' = .71$ ) and a small difference in helpfulness ( $d' = .27$ ). However, there are no differences between the groups on comfort level discussing cramping with their provider. Both groups scored in the “Moderate” range regarding comfort.

The effect size was calculated of the mean average menstrual cramping in the present study compared to the mean in each international study (see Table 12). The Cohen’s  $d$  ranged from .0 to .17 indicating there was no meaningful difference between the present study and international studies on reported average menstrual cramping. The effect size was calculated of the worst cramping experienced by young adult participants in the current study compared to adolescents in the US (see Table 13). The Cohen’s  $d$  was in the moderate range ( $d' = .71$ ). Additionally, the effect size was calculated of the mean age of menarche in the present study

Table 11

*Differences Between Low and High Dysmenorrhea Pain Groups*

Item	<i>n</i> Low Pain Group (LPG)	LPG Mean ( <i>SD</i> )	<i>n</i> High Pain Group (HPG)	HPG Mean ( <i>SD</i> )	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Paid Work	232	.34 (.62)	131	1.35 (1.26)	-10.21	361	.00	1.02
School Work	233	.53 (.74)	132	1.71 (1.29)	-11.10	363	.00	1.12
Work Around the Home	232	.91 (.89)	131	2.56 (1.14)	-15.38	361	.00	1.61
Physical Activities	229	1.02 (.89)	130	2.44 (1.0)	-13.93	357	.00	1.50
Social and Leisure Activities	229	.74 (.78)	130	2.32 (1.01)	-16.52	357	.00	1.75
Relationships with Others	229	.55 (.76)	130	1.64 (1.08)	-11.14	357	.00	1.17
Ability to Concentrate	229	.81 (.82)	130	2.20 (1.18)	-13.10	357	.00	1.37
Ability to Sleep	229	.58 (.76)	130	1.94 (1.25)	-12.83	357	.00	1.31
Discussed Cramping with the Healthcare Provider	228	2.16 (3.19)	126	4.66 (3.80)	-6.58	352	.00	.71
Comfort Level Discussing Healthcare Provider	226	6.84 (3.06)	127	6.36 (3.44)	1.34	351	.18	.15
Helpfulness of Discussing Cramping with Provider	228	2.95 (3.67)	127	3.94 (3.62)	-2.47	353	.01	.27

compared to the mean in each international study (see Table 14). The Cohen's  $d$  was in the moderate range for differences between this study sample and the Turkish sample, meaning that women in Turkey had a significantly older age of menarche than women in the study. There were no meaningful differences between the present study and the studies conducted in China, Italy, and Mexico on mean age of Menarche.

Table 12

*Average Level of Dysmenorrhea Pain in the Literature*

Study	<i>N</i>	Mean ( <i>SD</i> )	Numerical Scale Used	<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Present Study, Johnson 2018	795	5.4 (2.05)	0-10				
Aktas, 2015	168	5.78 (2.45)	0-10	794	-5.27	.000	.17
Chia et al., 2013	191	5.0 (1.7)	0-10	794	5.44	.000	.17
Grandi et al, 2012	408	50.2 (22.4)	0-100mm	794	5.16	.000	.10
Ortiz, 2009	961	54.1(23.4)	0-100mm	794	-.19	.850	0

*Note.* \*Comparison between study sample mean and international sample means.

Table 13

*Menstrual Cramping at its Worst in the US*

Study	<i>N</i>	Mean ( <i>SD</i> )	Numerical Scale Used	<i>df</i>	<i>t</i>	<i>P</i>	Cohen's <i>d</i>
Present Study, Johnson Campbell, 2018	796	7.38 (2.13)	0-10				
O'Connell et al., 2006	76	8.6 (1.2)	0-10	795	-16.08	.000	.71**

*Note.* \*Comparison between study sample mean and US adolescent sample mean.



Table 14

*Average age of Menarche in the literature and Comparison between study sample mean and international sample means*

Study	N	Mean (SD)	Df	t	p	Cohen's d
Present study, Johnson Campbell, 2018	962	12.34 (1.64)				
Aktas, 2015	200	13.24 (1.36)	961	-17.11	.000	.60
Chia et al., 2013	240	12.5 (1.2)	961	-3.08	.002	.11
Grandi et al., 2012	408	12.56 (1.32)	961	-4.21	.000	.15
Ortiz, 2009	1539	12.3 (1.5)	961	.72	.473	.03

## **Chapter 4**

### **Discussion**

#### **Implications of the Results**

This study surveyed 976 participants, ages 18-28, living in the United States regarding symptoms of dysmenorrhea. The age range was selected due to peak prevalence of dysmenorrhea occurring during late teens and early 20s (Osayande & Mehulic, 2014). Previous international studies of its kind have ranged from 200 – 1,539 participants. To the researcher's knowledge this is the largest current sample surveyed in the United States, providing helpful data on the prevalence of dysmenorrhea within this population. It is not considered representative because a majority of participants in this study identified as white, were college educated, and lived in the Pacific Northwest, differing from the greater US female population (Health Resources and Services Administration- Office of Women's Health, 2013). However, this is typical of studies in other countries, whose samples were composed mainly of students from a single university.

Age of menarche was comparable to studies of this type conducted in China, Italy, and Mexico, and differed from one study conducted in Turkey whose mean age was significantly older (Aktas, 2015, Chia et al., 2013; Grandi et al., 2012; Ortiz, 2009). A minimal inverse correlation was found between earlier menarche and dysmenorrhea, consistent with previous literature which suggested younger menarche may lead to more symptoms of dysmenorrhea (Chia et al., 2013; Grandi et al., 2012; Ju et al., 2013). Previous research has also found history of childbirth reduces instances of dysmenorrhea, however, within this sample very few participants endorsed a history of childbirth (Ju et al., 2013). Considering the high prevalence of

dysmenorrhea amongst this sample it is possible the lack of history of childbirth may contribute to this finding.

Of the various menstruation symptoms reported in the literature, as predicted, pelvic pain and cramping was endorsed by a majority of the sample, prevalent amongst 85% of participants. Women affected may be more likely to endorse severe pain numerically than when asked to describe their pain with vocabulary. Only 26% of participants used the terminology “severe” to describe their pain, yet slightly larger percentage of participants rated their average continuous cramping within the severe range on a numerical scale. Furthermore, roughly 70% of women reported experiencing at least one incidence of numerically rated “severe” pain within the last six months. This finding provides reason to believe women may be minimizing the severity of the cramping they experience when they discuss it and a numerical pain rating may be a more helpful representation of their experienced level of pain.

The mean rating of menstrual cramping on average given by participants in this study was comparable to previous international studies (Aktas, 2015, Chia et al., 2013; Grandi et al., 2012; Ortiz, 2010). The mean rating of menstrual cramping at its worst was moderately higher for adolescent females living in the US (O’Connell et al., 2006) than it was for the young adult women in this current study. This may be further indication that some women may experience improvements in menstrual cramping with age. Most importantly, the high prevalence of moderate to severe menstrual cramping amongst participants suggests dysmenorrhea may be a common problem for young women living in the United States.

In general, the results suggest that when women endorse menstrual cramping they tend to disclose the negative impact it has on multiple areas of functioning, especially work around

the home, physical activity, and social activity, all of which affect one's well-being.

Additionally, a significant number of women endorsed their menstrual cramping had an impact in school, and on their ability to concentrate. This is consistent with previous international studies which suggested dysmenorrhea may be frequently responsible for reduced academic performance (Chuamoor, Kaewmanee, & Tanmahasamut, 2012; Gagua, Tkeshelashvili, & Gagua, 2012). As a result, dysmenorrhea is a significant burden for young women during a crucial time in life, when both responsibility and productivity are expected to increase.

Furthermore, pain conditions that affect daily living so significantly typically warrant discussion with healthcare providers, however, this study did not find this to be the case.

Despite high levels of pain and impact on functioning, nearly half of all participants had not spoken to their healthcare providers *at all* about their dysmenorrhea symptoms within the last year. International research suggests the prevalent belief that pelvic cramping is a normal part of menstruation may be to blame for the lack of discussion with healthcare providers, as well as embarrassment discussing menstruation (Berkley & McAllister, 2011; Chan et al., 2009; Ortiz, 2010). This is consistent with the current findings where 75% of participants disclosed moderate to significant discomfort discussing menstrual cramping with their provider. These findings are concerning due to previous research suggesting reluctance to discuss menstrual discomfort was positively correlated with higher rates of dysmenorrhea (Aktas, 2015). Of the participants who had previously spoken to a health care provider about their menstrual cramping, nearly half reported it was *not at all* helpful.

The most common treatment strategies endorsed by participants was the use of shower or baths, sleep, heat, and warm beverages. The same treatment strategies were also endorsed within

international studies. These “home remedies” are likely passed down from mothers, and other elder females. Despite research indicating NSAIDS are an effective treatment option for dysmenorrhea, only 52% of women endorsed using them as treatment strategy (Daniels et al., 2009; Osayande & Mehulic, 2014; Proctor & Faruqhar, 2006). Additionally, 20% of participants used birth control medication to treat dysmenorrhea symptoms despite the unknown efficacy of birth control medication in treating primary dysmenorrhea (Osayande & Mehulic, 2014; Ou et al., 2012; Proctor & Faruqhar, 2006). Both the usage of birth control and the lack of using NSAIDs may be due to the lack of in depth communication with treatment providers, leaving women uninformed about effective treatment strategies.

When comparing participants in the low dysmenorrhea pain group to those in the high dysmenorrhea pain group, there was a large difference in terms of the impact it had on participants daily functioning. Those with higher pain levels were less able to keep up with their activities of daily living. Those with higher pain were also more likely to have discussed their dysmenorrhea with their healthcare provider at greater length and found their conversation with their healthcare provider to be slightly more helpful than those with lower pain levels. However, there was no significant difference between the high and low dysmenorrhea pain groups in terms of their comfort level when discussing menstrual cramping with their healthcare provider. This finding may suggest that those who have higher pain, causing a greater negative impact on their lives, likely have more motivation to overcome the discomfort of discussing their menstrual cramping with their healthcare provider.

Of the participants who endorsed dysmenorrhea, only 8.5% disclosed relevant diagnoses. Most women in the study were experiencing primary dysmenorrhea, meaning their pelvic pain

and cramping had not been labeled as a symptom of another reproductive organ disorder. However, several participants indicated their provider suggested they may have either endometriosis or polycystic ovaries, but they had not been formally diagnosed. For instance, one participant wrote, “Obgyn won't diagnose because ‘There was no benefit of being diagnosed with endometriosis. Even though I probably have it.’” This is concerning in light of a previous study conducted on women surgically diagnosed with endometriosis, in which 84% had previously disclosed menstrual pain to their healthcare provider (Greene, Stratton, Cleary, Ballweg & Sinaii, 2009). In the process of seeking help two thirds of the participants in the Greene et al. study were told by at least one physician that nothing was wrong with them. This finding was even more likely to be true for women who first disclosed symptoms in adolescence, when most women experience their first symptoms of endometriosis. Additionally, previous studies have indicated the diagnostic process for endometriosis is longer for women experiencing pain than it is for women experiencing infertility (Arruda, Petta, Abrao, & Benetti-Pinto, 2003; Dmowski, Lesniewicz, Rana, Pepping, & Noursalehi, 1997). Greene et al. (2009) found it took an average of roughly five years for women to receive a formal diagnosis of endometriosis, and this was tripled for women who first discussed symptoms in adolescence. One possible barrier in diagnosing endometriosis when menstrual cramping is the primary symptom is the shared perception by both the physician and the patient that the patient is not ill due to the normalizing of moderate to severe menstrual cramping (Ballard, Lowton, & Wright, 2006; Greene et al., 2009).

**Social Considerations of Research Findings**

Menstruation has been used as an excuse for women's "unsuitability" in everything from pursuing a college education to being elected into political positions and various other leadership opportunities (Delaney et al., 1988). As Bobel states,

We walk a fine line between views of menstruation as incapacitating and inconsequential.... Blaming biology for the behavior of women (or men) is a classically anti-feminist position, but so is the failure to take women at their word and validate their experiences (2010, p. 36-37).

However, while the effort is made to dismantle the idea that menstruation is debilitating for all women, we must also acknowledge the problems it does present for a significant number of women (Golub, 1985). Previous research suggests menstruation still remains largely negative in both Western and non-Western cultures (Thurén, 1994). However, it is suggested by Berkley and McAllister (2011), that times are changing, and today's young women do not view menstruation as such a taboo. The investigator of this study found this to be true, not only did participants actively engage in further distributing the survey to their own communities, but several women who were outside of the age range wrote the researcher to express a desire to share their own experiences with menstruation.

**Limitations**

Notable limitations in the current study include the self-report measures, which may have led to recall bias and possible over-reporting. Furthermore, it is possible women with more negative experiences of menstruation were more likely to participate in the survey. Due to the lack of validated measures regarding dysmenorrhea, the results of this study should be

interpreted with caution. While participation was voluntary, and the survey took under 10 minutes to complete, several participants did not complete the questionnaire, also possibly impacting the results. Given the age range and distribution methods used, most of the women in this study were enrolled in university, living in the Pacific Northwest, and a majority identified as white. Due to the lack of diversity amongst this population, this study may not be accurate representation of the experiences of all women living within the United States. Particularly, information gathered on impact on employment, treatment strategies, and communication with health care providers may vary outside of the university system and may be impacted by cultural traditions and disparities in access to health care (National Healthcare Quality and Disparities Reports, 2011).

### **Future Research**

Berkley and McAllister (2011) previously challenged researchers in the pain community to give moderate-to-severe dysmenorrhea its much-deserved place in pain research, and the findings of this exploratory study provide further evidence for this necessary call to action. Future research may benefit from developing validated measures of dysmenorrhea symptoms and its impact on functioning. Additionally, communication with healthcare providers, improving patient perception of provider treatment and investigating common beliefs regarding menstrual cramping amongst both patients and providers all warrant further exploration. Possible areas include: gathering data from healthcare providers regarding their experiences of communicating with patients about menstrual concerns and treatment, assessing the efficacy of treatment strategies for dysmenorrhea, exploring differences in rates of dysmenorrhea amongst women who have experienced childbirth and of various age ranges, and assessing impact on



employment on a larger sample of employed participants. Future research may also benefit from collecting data from a more culturally diverse sample of the population. Additionally, data gathered from medical providers on how they perceive and treat dysmenorrhea may be a beneficial addition to the literature.

## **Conclusion**

The present study found dysmenorrhea may have a high prevalence amongst young women living within the United States. Of the 85% of participants who endorsed dysmenorrhea symptoms, 70.1% rated their symptoms as moderate to severe, and 69.7% endorsed at least one experience of severe pain within the last six months. Dysmenorrhea was positively correlated with impaired functioning particularly in physical activity, social functioning, and activities around the home. Participation in school and impairments to concentration were also frequently endorsed. Despite high rates of pain, and impairment on functioning, nearly half of all participants had not spoken to their health care provider at all within the last year about their dysmenorrhea symptoms. Additionally, of those who had spoken to a health care provider about their symptoms 46.3% found it to be *not at all helpful*. Participants endorsed using on average 4.75 treatment strategies, most of which were home remedies. One possible implication of these findings is the potential delay in diagnosing endometriosis due to dysmenorrhea being considered normal and therefore not assessed or treated. The implications of a delayed diagnosis such as endometriosis are grave, potentially leading to delayed surgery, impacts on fertility, and other consequences. Therefore, providers need to routinely ask about menstrual pain and consider discussing treatment options with women who otherwise will continue to suffer in silence.

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## Appendix A

### Informed Consent

#### **Informed Consent: Exploring Women's Experiences with Menstrual Cramping**

I authorize Annika Johnson of the Graduate School of Clinical Psychology, George Fox University, Newberg, Oregon, and/or any designated research assistants to gather information from me on the topic of symptoms during menstruation.

I understand that the general purposes of the research are to evaluate the prevalence, impact, and treatment of pain during menstruation. I understand that I will be asked to answer questions, and that the approximate total time of my involvement will be under 10 Minutes. There is no foreseeable risk to participating in this research. The information gathered in this survey may benefit women's health care providers by adding to the current literature on experiences during menstruation.

I understand that my participation is voluntary and that I may refuse to participate or discontinue my participation at any time without penalty or loss of benefits to which I am otherwise entitled. I understand that if, after my participation, I experience any discomfort or have questions about the research or my rights as a participant, I can contact Annika Johnson, MA (ajohnson15@georgefox.edu) or Marie-Christine Goodworth, Ph.D, faculty supervisor (mgoodworth@georgefox.edu), Graduate School of Clinical Psychology, 414 N Meridian St V104, Newberg, OR 97132. I understand confidentiality of research results will be maintained by the researcher, and my individual results will not be released without my written consent. This survey was approved by the Institutional Review Board of the George Fox University.

Upon completion of this survey you will be given the opportunity to provide your email if you would like to be entered into a drawing to win one of several 10-dollar gift certificates to Amazon. This information will be stored separately from your survey data, and will be kept safe and secure.

By continuing on to the survey I am agreeing to authorize Annika Johnson of the Graduate School of Clinical Psychology at George Fox University, and/or any designated research assistants to gather information from me on the topic of symptoms during menstruation.

Thank you so much for your time and participation!

**Appendix B**  
**Survey Questionnaire**

**Inclusion Criteria:**

1. Are you female?  
Yes  
No
2. Are you between the ages of 18-28?  
Yes  
No
3. Are you currently living in the United States of America?  
Yes  
No

**Questionnaire**

4. What is your current age?
5. What is the highest-grade level you have completed?
6. What is your race/ethnicity? Please check all that apply  
Non-Hispanic white or Euro-American  
Black, Afro-Caribbean, or African American  
Latino or Hispanic American  
East Asian or Asian American  
South Asian or Indian American  
Middle Eastern or Arab American  
Native American or Alaskan Native  
Other
7. At what age did you experience your first period?
8. During the past 6 months, have your menstrual cycles been regular and predictable?  
Never  
Rarely  
Sometimes  
More often than not  
Almost always

9. During the past 6 months, how many menstrual periods have you experienced?
10. On average during the past 6 months, how much did you bleed during menstruation?  
No bleeding  
Very light bleeding or spotting  
Light bleeding  
Moderate bleeding  
Heavy bleeding
11. During the past 6 months, what was the average length of your period?
12. Over the last 6 months have you experienced any of the following due to your menstrual period, please check all that apply:

	None	Mild	Moderate	Severe
Abdominal cramping				
Joint/muscle pain				
Leg aches				
Backache				
Acne				
Swollen or tender breasts				
Feeling tired				
Trouble sleeping				
Upset stomach/Nausea				
Bloating				
Constipation/diarrhea				
Headache/Migraine				
Appetite changes				
Trouble with concentration or memory				
Tension, irritability, mood swings, or crying spells				
Anxiety				
Depression				

13. On average during the past 6 months, how would you rate your menstrual discomfort?  
0 (no discomfort), 1, 2, 3, 4, 5 (moderate discomfort), 6,7, 8, 9, 10 (extreme discomfort)

**For the purpose of this survey, pelvic pain/cramping involves pain in the lower abdomen, back, and thighs, and may be accompanied by other symptoms such as nausea, vomiting, diarrhea, and fatigue.**

14. During the past 6 months, have you experienced any degree of pelvic pain or cramping along with menstruation?  
Yes  
No

15. On average during the past 6 months, how would you rate your menstrual pelvic pain or cramps?

0 (no pain/cramping), 1, 2, 3, 4, 5 (moderate pain/cramping), 6, 7, 8, 9, 10 (severe pain/cramping)

16. During the past 6 months, at its worst, how would you rate your menstrual pelvic pain or cramps?

0 (no pain/cramping), 1, 2, 3, 4, 5 (moderate pain/cramping), 6, 7, 8, 9, 10 (severe pain/cramping)

17. During the past 6 months, on average, how many days of your period do you experience pelvic pain/cramping?

1 day

2 days

3 days

Entire period

18. In the past 6 months, how much did pelvic pain or cramping during menstruation limit you in your....

Paid work: Not at all, slightly, moderately, quite a bit, extremely, N/A

School work: Not at all, slightly, moderately, quite a bit, extremely, N/A

Work around the home: Not at all, slightly, moderately, quite a bit, extremely, N/A

19. In the past 6 months, how many days of paid work or school work did you miss because of pelvic pain or cramping?

20. In the past 6 months, have you lost wages due to your menstrual pain/cramping?

Yes

No

21. Approximately how much money did you lose due to your menstrual pelvic pain/cramping

22. In the past 6 months, how much did pelvic pain or cramping during menstruation limit you in your...

Physical activities: Not at all, slightly, moderately, quite a bit, extremely

Social or leisure activities: Not at all, slightly, moderately, quite a bit, extremely

Relationships with others: Not at all, slightly, moderately, quite a bit, extremely

Ability to concentrate: Not at all, slightly, moderately, quite a bit, extremely

Ability to sleep: Not at all, slightly, moderately, quite a bit, extremely

23. During the past 6 months, which of the following have you used to treat your menstrual related pelvic pain/cramps, please check all that apply:

Acetaminophen (Tylenol)  
Pamprin or Midol  
NSAID (Aspirin, Ibuprofen, Naproxin etc.)  
Narcotics (Hydrocodone, Oxycodone)  
Contraceptives (Birth control pills, patches, rings etc.)  
Acupuncture  
Massage  
Herbal medicines  
Warm beverage  
Sleep  
Postural adjustments  
Yoga  
Applying heat  
Showers/baths  
Exercise  
Television or distraction  
Special food and drink  
Dietary/nutritional supplements  
Alcohol  
Marijuana  
Other (please specify)

24. Have you ever had to seek emergency or same-day care due to menstrual related pelvic pain/cramping?

Yes  
No

25. I have discussed my menstrual pain with my healthcare provider within the last year

0 (not at all), 1, 2, 3, 4, 5 (Briefly discussed), 6,7, 8, 9, 10 (Discussed at length)

26. I feel comfortable discussing my menstrual pain with my healthcare provider

0 (not comfortable at all), 1, 2, 3, 4, 5 (Moderately comfortable), 6,7, 8, 9, 10 (Very comfortable)

27. How helpful was talking to your healthcare provider about your menstrual pain?

0 (not helpful at all), 1, 2, 3, 4, 5 (neutral), 6,7, 8, 9, 10 (Very helpful)

28. During the past 6 months, have you used any of the following contraceptive methods?

The pill

IUD  
Patch/injection  
Implant  
Ring  
None  
Other (Please specify)

29. Have you ever been diagnosed with a reproductive organ disorder, please check all that apply:

Endometriosis  
Adenomyosis  
Uterine fibroids  
Polycystic Ovary Syndrome  
Infection  
N/A  
Other (Please Specify)

30. Are you currently pregnant?

Yes  
No

31. Have you ever been pregnant?

Yes  
No

32. Have you ever given birth?

Yes  
No

33. How did you hear about this survey?

University setting  
E-mail  
Friend or peer  
Other

34. Would you like to be entered into a drawing to win one of at least 20 \$10.00 Amazon gift cards?

Yes  
No

**Thank you for your participation. In order to keep your survey answers anonymous, please follow the link below to enter your E-mail address in the Amazon gift card drawing. Email addresses provided will in no way be linked to survey responses.**

**<https://www.surveymonkey.com/r/JXWZZ6Q>**



## Appendix C

### Curriculum Vitae



#### **Education**

##### **Doctoral Candidate of Clinical Psychology**

**Anticipated April 2020**

*Graduate School of Clinical Psychology (APA-Accredited)*

*George Fox University Newberg, OR*

*Dissertation: The Prevalence and Impact of Dysmenorrhea in Young Women within the United States*

##### **Master of Arts in Clinical Psychology**

**April 2017**

*Graduate School of Clinical Psychology (APA-Accredited)*

*George Fox University, Newberg, OR*

##### **Bachelor of Science in Psychology**

**June 2014**

##### **Minor in Health**

*Magna Cum Laude*

*Western Oregon University, Monmouth, OR*

#### **Supervised Clinical Experience**

##### **Lancaster Family Health Center**

**June 2018- Present**

*Salem, OR*

*Title: Pre-Intern Behavioral Health Trainee*

*Organization: Yakima Valley Farm Workers Clinic*

*Treatment Setting: Federally Qualified Health Clinic*

*Treatment method: Brief therapeutic intervention with individuals, families, couples, and in groups*

*Populations: Culturally diverse, low income populations across the lifespan, and LGBTQ+ care*

*Supervisor: Dr. Lola White, PsyD*

*Duties:*

- Provide brief intervention using empirically supported practice, including Acceptance & Commitment Therapy, CBT, and Motivational Interviewing
- Co-facilitate group therapy with transgender and gender non-conforming patients to provide additional support throughout transitioning process
- Developed a group medical visit curriculum for patients with diabetes
- Continued daily patient care through brief therapeutic modalities and assessment

**Lancaster Family Health Center****July 2017- June 2018***Salem, OR**(Please see information above)**Title: Practicum II Behavioral Health Trainee**Supervisor: Dr. Lola White, PsyD**Duties:*

- Provide brief intervention using empirically supported practice, including Acceptance & Commitment Therapy, CBT, and Motivational Interviewing
- Administer thorough screening and appropriate referrals in cases of ADHD, autism, and dementia
- Coordinate care in a multidisciplinary setting with medical providers, nursing staff, registered dietitian, and social workers
- Engaged in patient care at other Yakima Valley Farm Workers clinics in the Willamette Valley for additional clinic experience
- Participate in Primary Care Health Home meetings to improve patient access to preventative screenings and healthcare services, as well as to monitor clinic progress for grant funding

**George Fox Behavioral Health Center****Aug 2016- June 2017***Newberg, OR**Title: Practicum I Student Therapist**Treatment Setting: Outpatient Community Health Clinic, Catalyst alternative high school**Treatment Method: Individual therapy, couples therapy, group therapy**Populations: Culturally and economically diverse populations across the lifespan**Supervisors: Joel Gregor, PsyD and Kristie Knows His Gun, PsyD**Duties:*

- Offered both long-term and brief interventions using Interpersonal, and Acceptance & Commitment Therapy methods
- Administer psychological assessment to adult clients to determine diagnostic clarification and fitness for employment
- Developed and piloted group therapy curriculum for adolescents with anxiety attending a local alternative high school
- Responsible for maintaining my own patient schedule and billing

**George Fox University Pre-practicum****Sep 2015- Apr 2016***Newberg, OR*

*Title: Pre-practicum Student Therapist*

*Treatment Setting: University*

*Populations: George Fox University undergraduate students*

*Supervisors: Glenna Andrews, PhD and Shaun Davis, TA, M.A.*

*Duties:*

- Provided individual intervention from a person-centered therapeutic framework with-in a 10-session limit
- Formulated diagnostic impressions, treatment plans, and maintained client notes

### **Selected Relevant Experience**

#### **George Fox University Idea Center**

**Sep 2015- Nov 2016**

Newberg, OR

*Title: Assistant Career Coach*

*Setting: University career center*

*Population: Undergraduate and graduate students enrolled at George Fox University*

*Supervisor: Elise Gibson, M.S.*

- Provided career counseling to university students exploring future employment opportunities during one-on-one sessions
- Collaborated with students to help them identify their strengths and articulate their experiences throughout the job application process

#### **Marion County District Attorney's Victim Assistance Office**

**Jan 2012- Jul 2015**

Salem, OR

*Title: Victim's Advocate*

*Treatment Setting: Marion County emergency rooms and law enforcement agencies*

*Populations: Adolescent, adult, and elderly females from diverse cultural and socioeconomic backgrounds*

*Supervisors: Molly Hawkins and Kathie Beach*

*Duties:*

- Responded in-person to hospitals and law enforcement agencies during 24-hour shifts to provide crisis intervention, information, resources and support to survivors of sexual assault
- Collaborated with law enforcement and medical professionals to coordinate treatment, advocating on behalf of the survivor's needs

#### **Abby's House Center for Women and Families**

**Aug 2012- Jun 2013**

Western Oregon University, Monmouth, OR

*Title: Advocate*

*Treatment Setting: University*

*Populations: Undergraduate students and faculty and staff, primarily undergraduate females*

*Supervisor: Mary Ellen Dello-Stritto, PhD*

*Duties:*

- Facilitated process group discussions on domestic violence, sexual assault, and disordered eating

- Planned and implemented campus-wide awareness raising programs by collaborating with the Health and Counseling Center and the bystander intervention program Green Dot

### **Published Manuscripts**

**Johnson, A. M.**, & Hoover, S. M. (2015). The Potential of Sexual Consent Interventions on College Campuses: A Literature Review on the Barriers to Establishing Affirmative Sexual Consent, *Pure Insights*, 4(5). Retrieved from <http://digitalcommons.wou.edu/pure/vol4/iss1/5>

### **Presentations**

Marston, A., **Johnson, A.**, Wenger, A., David, A., & Goodworth, M.C. (2018). Body shame differences between clergy and non-clergy in women in the church of the Nazarene. Poster presented at American Psychological Association, San Francisco, California.

Ramirez, S., Leonce, C., **Johnson, A.**, Campo, V., & Gathercoal, K. (2018). Efficacy of a multidisciplinary response to treating chronic pain and depressive symptoms in a rural population. Poster presented at the Oregon Psychological Association, Portland, Oregon.

**Johnson, A.**, & Summers, W. (2017). Is this normal? Discussing sexual dysfunction in therapy. Presented at George Fox University, Newberg, Oregon.

Davis, S., Terman, J., Speck, C., Malone, M., Goins, N., **Johnson, A.**, & Turgeson, J. (2016) Assessment of Pediatric Behavioral Health Services in a Primary Care Setting. Poster presented at the Oregon Psychological Association, Portland, Oregon.

**Johnson, A.**, Johnston, M., Bostwick, J., Rodriguez, C., & Rubio, X. (2015). Treatment Integrity for Culturally Accommodated Treatment for Latino Adolescents. Presented at the Oregon Academy of Sciences, Portland, Oregon.

Bostwick, J., **Johnson, A.**, & Ahrensbach, M. (2014). Social justice identity of mental health counselors. Poster presented at the Academic Excellence Showcase, Western Oregon University, Monmouth, Oregon.

Hoover, S. M., & **Johnson, A.** (2014). Pediatric death, organ donation decision making, and parental grief. Presented at the Annual Convention of the Western Psychological Association, Portland, Oregon.

### **Research Experience**

*Dissertation Topic: The Impact of Dysmenorrhea in the Lives of Young Women within the United States*

Committee: Marie-Christine Goodworth, PhD (Chair), Kathleen Gathercoal, PhD, William Buhrow, PsyD

- Largest sample of dysmenorrhea amongst young women in the US,  $n = 976$

- Assessed level of pain, impact on functioning, treatment strategies, and communication with healthcare providers

***Consultation Project: What is the current level of cultural awareness amongst Graduate School of Clinical Psychology students?***

- Research conducted on graduate students' level of multicultural awareness and multicultural exposure
- Used quantitative and focus group data to provide suggestions on improving diversity training

***Research Team Member***

**Jan 2016- Present**

Marie-Christine Goodworth, PhD., George Fox University, Newberg, OR

- Provide edits on working manuscripts
- Collaborate with team members on dissertation topics and engage in supplemental research
  - Mental health outcomes in the treatment of Tinnitus
  - Body shame amongst clergy and non-clergy women
  - Multidisciplinary treatment of chronic pain and depression in a rural setting
- Participate in qualitative research methods and provide feedback to peers
  - Shame and sexuality amongst women within the Catholic church
  - Staff perspectives of treating pain within a Federally Qualified Health Center

***Research Assistant***

**Feb 2014- Jun 2015**

Stephanie Hoover, PhD., Western Oregon University, Monmouth, OR

- Assisted with the analyses of multiple studies
  - Pediatric death, organ donation, and parental grief
  - Treatment adherence for culturally adapted substance abuse treatment for Latino adolescents
  - Intersectional and social justice identities amongst mental health professionals
  - Qualitative research methods for sexual trauma survivors
- Analyzed qualitative data using Grounded Theory method
- Revised introduction, results, and discussion of manuscripts
- Presented material at multiple psychological conferences

***Primary Investigator***

**Jan 2014- June 2014**

Title: Relationship History and its Effect on the Perception of Sexual Consent

Psychology 467/468, Western Oregon University, Monmouth, OR

- Designed and conducted IRB approved original study with university participants
- Performed statistical analysis with SPSS and reported findings in both an APA formatted manuscript and in a power point presentation

**Leadership Experience**

***American Psychological Association-***

**Sept 2017-Aug 2018**

***Society for Health Psychology Campus Representative***

- Promoted health psychology opportunities and generate interest in topics of health psychology
- Hosted informational panels and guest speakers to discuss relevant topics on health psychology

***GFU Graduate School of Clinical Psychology-  
Gender and Sexuality Student Interest Group Leader***

**Aug 2017- Aug 2018**

- Facilitated student dialogues on topics of gender, sexuality, and identity issues
- Presented didactics on topics of gender, sexuality, and identity issues

***American Psychological Association-  
Psychology of Women Campus Representative***

**Sept 2016- Aug 2018**

- Hosted campus events to facilitate learning and increase student dialogue regarding feminist issues
- Submitted blog posts on relevant feminist topics published on the Division 35 FEMPOP website

**Teaching Experience**

***Teaching Assistant***

**Aug 2018- Dec 2018**

Cognitive Behavioral Therapy

Dr. Mark McMinn, George Fox University- Graduate School of Clinical Psychology  
Newberg, OR

- Met with small student groups weekly to provide encouragement and feedback regarding theoretical conceptualization and intervention application
- Co-facilitated lecture on the role of CBT & ACT interventions within the primary care setting

***Teaching Assistant***

**Aug 2013- Dec 2013**

Developmental Psychology (PSY 311)

Dr. Tamina Toray, Western Oregon University, Monmouth, OR

- Provided individual feedback to students regarding performance on exams and papers
- Facilitated group study sessions and maintained routine office hours to meet with students
- Assisted in the creation of and the grading for quizzes, exams, and observational research papers

**Supervision Experience**

***Peer Supervisor***

**Oct 2018-Present**

Yakima Valley Farm Worker's Clinic, Willamette Valley, OR

- Meet bi-weekly via webcam to provide additional support & supervision to another practicum student new to the integrated care model

**4<sup>th</sup> Year Mentor****Aug 2018- Present**

Clinical Team, GFU Graduate School of Clinical Psychology, Newberg OR

- Meet weekly with practicum 1 student to provide additional supervision
- Oversee clinical work, provide mentorship, and guide professional development
- Receive supervision of supervision from Dr. Kristie Knows His Gun, PsyD

**Professional Trainings and Certificate Courses***Gender and Sexuality***Sept 2018-Nov 2018**

George Fox University: Graduate Certificate Course, Newberg OR

Brooke Kuhnhausen, PhD

*Transgender Health: Best Practices in Advanced Medical Treatment***Sept 2018**

The World Professional Association for Transgender Health, Portland, OR

Lin Fraser, EdD, Randi Ettner, PhD, Jess Guerriero, MSW, MA, Dan Karasic, MD

*Attachment in Psychotherapy***Jan 2018- April 2018**

George Fox University: Graduate Certificate Course, Newberg OR

Brooke Kuhnhausen, PhD

*Acceptance & Commitment Therapy: An Experiential and Practical Introduction***Dec 2017**

Portland Psychotherapy Clinic, Portland, OR

Jason Luoma, PhD &amp; Jenna LeJeune, PhD

**Clinical Colloquia and Grand Rounds***The History and Application of Interpersonal Psychotherapy***Feb 2018**

George Fox University, Newberg, OR

Carlos Taloyo, PhD

*Telehealth***Nov 2017**

George Fox University, Newberg, OR

Jeff Sordahl, PsyD

*Using Community Based Participatory Research (CBPR) to Promote***Oct 2017***Mental Health in American Indian/Alaska Native (AI/AN) Children, Youth and Families*

George Fox University, Newberg, OR

Eleanor Gil-Kashiwabara, PsyD

*Domestic Violence: A Coordinated Community Response***Mar 2017**

George Fox University, Newberg, OR

Patty Warford, PsyD &amp; Sgt Todd Baltzell

*Native Self Actualization: Its assessment and application in therapy***Feb 2017**

George Fox University, Newberg, OR

Sydney Brown, PsyD

*When Divorce Hits the Family: Helping Parents and Children Navigate* **Nov 2016**  
 George Fox University, Newberg, OR  
 Wendy Bourg, PhD

*Sacredness, Naming, and Healing: Lanterns Along the Way* **Oct 2016**  
 George Fox University, Newberg, OR  
 Brook Kuhnhausen, PhD

*Managing with Diverse Clients* **Mar 2016**  
 George Fox University, Newberg, OR  
 Sandra Jenkins, PhD

*Neuropsychology: What Do We Know 15 Years After the Decade of the Brain? And Okay, Enough Small Talk. Let's Get Down to Business!* **Feb 2016**  
 George Fox University, Newberg, OR  
 Trevor Hall, PsyD and Darren Janzen, PsyD

*Let's Talk About Sex: Sex and Sexuality Applications for Clinical Work* **Oct 2015**  
 George Fox University, Newberg, OR  
 Joy Mauldin, PsyD

*Relational Psychoanalysis and Christian Faith: A Heuristic Dialogue* **Oct 2015**  
 George Fox University, Newberg, OR  
 Marie Hoffman, PhD

### **Other Certificates and Trainings**

*Protecting Human Research Participants* **Sept 2018**  
 National Institutes of Health Online Training

*Basic Life Support for Healthcare Provider* **Nov 2017**  
 George Fox University, Newberg, OR

*Screening, Brief Intervention, Referral to Treatment (SBIRT)* **Mar 2016**  
 George Fox University, Newberg, OR

*Collaborative Assessment and Management of Suicidality (CAMS)* **Mar 2016**  
 George Fox University, Newberg, OR

### **Organizational Memberships**

The World Professional Association for Transgender Health **Since 2018**  
 Society of Menstrual Cycle Research **Since 2017**  
 American psychological Association, Society of Health Psychology **Since 2017**



## DYSMENORRHEA

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American Psychological Association, Student Affiliate  
American Psychological Association, Psychology of Women  
GSCP Clinical Health Psychology Student Interest Group  
GSCP Diversity Student Interest Group  
GSCP Gender and Sexuality Student Interest Group

**Since 2015**  
**Since 2015**  
**Since 2015**  
**Since 2015**  
**Since 2015**

### **Awards**

Outstanding Graduating Student in Psychology  
Western Oregon University, Monmouth, OR

**Spring 2014**