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***The Impact of Attention-Deficit Hyperactivity Disorder  
and Emotion Regulation on Dysmenorrhea and  
Quality of Life***

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**Psychology Empirical Project**

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*Dissertation submitted in partial fulfilment of the requirements for the  
degree of Bachelor of Science (hons) in Applied Psychology*

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## Abstract

Previous, limited, research suggests a link between attention deficit hyperactivity disorder (ADHD), emotion regulation, and dysmenorrhea, and reduced quality of life. The current study identifies an adult population of female university students (n=95) using a between-subjects, factorial, two-way MANOVA design, and compares menstrual symptom severity (MSS) and quality of life (QoL) for women with, and without an ADHD diagnosis, and levels of emotion regulation difficulties (ERD). ERD were found to have a significant effect on MSS scores but not QoL, a trend in the ADHD groups was seen but the result was non-significant and there was a non-significant interaction effect reported between ADHD and ERD on MSS and QoL. Emotion regulation skills should be considered in the management of menstrual health and ADHD symptoms, however it is surprising that there was no impact on quality of life found and further research is needed to evaluate the processes between ADHD, emotion regulation and pain perception in women's health.

## **Chapter 1. - Literature Review**

### **1.1 Introduction**

An association between attention deficit hyperactivity disorder (ADHD) and heightened pain perception has been widely researched, and findings suggest that individuals with ADHD are significantly more at risk of experiencing increased pain than a neurotypical population (Stickley et al., 2016; Treister et al., 2015) and developing a chronic pain disorder in adulthood (Asztely et al., 2019). Additionally, there is an increased prevalence of ADHD in chronic pain populations (Kerekes et al., 2021). However, there is still a lot to be understood about the mechanisms and complexities behind the associated risks for individuals with ADHD. This has mostly been investigated in populations of chronic or acute pain disorders (Battison et al., 2023), but little is known about menstrual symptom severity and potential interactions with ADHD symptoms (Kabukcu et al., 2021). Initial findings suggest that there is a link between ADHD and menstrual symptom severity, more importantly, that this association negatively impacts the quality of life for those who experience high levels of both ADHD symptoms and menstrual symptoms (Sagsoz et al., 2021). One possible mechanism that influences both ADHD and pain experiences is emotion regulation (Bruton et al., 2022) and it is suggested that individuals with difficulties in emotion regulation may be more likely to exhibit severe ADHD symptoms, and to experience heightened pain sensitivity (Brown et al., 2025; Kerekes et al., 2021).

### **1.2 Dysmenorrhea**

Dysmenorrhea, or menstrual pain, ranges from mild to severe symptoms and regularly occurs in female populations worldwide (McKenna & Fogleman, 2021). Reported statistics vary widely due to inconsistency in definitions of dysmenorrhea and methodological

approaches, a review by Ju et al., (2014) identified the prevalence of dysmenorrhea in adult women is between 45-91%, and up to 29% report severe symptoms. In a study of 623 female Turkish University students, Unsal et al. (2010) found 72.7% experienced dysmenorrhea (66.2% had moderate to severe symptoms), and increased severity of symptoms was directly correlated to lower Health-related Quality of Life (HRQoL) scores, meaning individuals that regularly experience moderate to severe dysmenorrhea have significant disruption to both personal, and professional life. Similarly, 76% of Spanish university students (n = 305) reported dysmenorrhea, and was a factor that led to a reduced quality of life (Fenandez-Martinez et al., 2019). Furthermore, students without symptoms participated in more activities, such as jogging and Pilates, suggesting they had less disruption to leisure, fitness, and social engagement, therefore increasing quality of life. However, it is worth noting that both studies were conducted with a student population, with a mean age of 20 years. As it is a relatively young, adolescent, sample, they are predisposed to experience increased dysmenorrhea symptoms, as menstrual symptom severity is known to reduce with increased age, which could explain the high symptom prevalence and severity of both studies (Ju et al., 2014).

Dysmenorrhea is categorised into two types, Primary Dysmenorrhea (PD) where there is no underlying medical condition that causes symptoms, and Secondary Dysmenorrhea (SD) where there is an underlying pelvic medical condition present, such as endometriosis, polycystic ovary syndrome, or fibroids (Wang et al., 2022). Dysmenorrhea symptoms include fatigue, dizziness, lower abdominal pain, lower back pain, pain in the thighs, nausea, vomiting, headaches, diarrhoea, sleep disturbances, loss of concentration and changes in mood (McKenna & Fogleman, 2021). According to a cross-sectional study of 32,748 women in the Netherlands by Schoep et al., (2019), it is a leading cause of absenteeism and reduced productivity in the workplace, and education settings. Up to 80% of women reported reduced

productivity across 23.2 days, and 13.8% reported work absence due to menstrual symptoms. It is known to significantly reduce sufferers' quality of life by interrupting daily activities, sporting and social events, affecting interpersonal relationships, as well as physical health and well-being (Fernandez-Martinez et al., 2019). The financial burden to the individual and the workforce economy is significant due to workplace absence, medical treatment, purchasing products, and productivity loss (Ponzo et al., 2022).

Another key issue is the social stigma attached to reporting and discussing menstrual health, exacerbated by medical practitioners who routinely normalise a legitimate health issue (Burger et al., 2024; Cook & van den Hoek, 2023), resulting in patients feeling dismissed and unvalidated (McKenna & Fogleman, 2021; Schoep et al., 2019) and less likely to report medical concerns, leading to delays in diagnosis and treatment.

### 1.3 Attention-Deficit Hyperactivity Disorder

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterised by impulsivity, hyperactivity, attention and emotion regulation difficulties (Hirsch et al., 2018), and impaired cognitive, emotional and behavioural function (Eng et al., 2024). According to NHS England (2024), ADHD affects 5% of the global population in childhood and between 3-4% of the adult population. Previously thought to affect boys 2-2.5 times more than girls (Hinshaw et al., 2021), but more research is being carried out on adult and female ADHD populations shows the gender gap is closing in adult ADHD cases, and there are gender differences in ADHD symptoms (Attoe & Climie, 2023). Recent understanding indicates hyperactivity is often more internalised for women with ADHD, through hyperactive thoughts, women are more likely to have an inattentive presentation, compared to a typical male presentation of the disorder (Asztely et al., 2019). Meaning that

there are gender differences in ADHD symptoms and a female presentation is typically quieter and less disruptive, and many may have learnt to mask their symptoms as a coping strategy (Antoniou et al., 2024; Attoe & Climie, 2023). Consequently, ADHD in women has been historically underreported and underdiagnosed, or misdiagnosed in women (Hinshaw et al., 2021). Late diagnosis or untreated ADHD in women can lead to significantly high levels of impairment to academic and professional success, (Eng et al., 2024). Even when higher levels of ADHD symptoms are recorded for males, their female counterparts still experience more life impairments (Oerbeck et al., 2015), affecting interpersonal relationships, unemployment, increased levels of substance abuse and anti-social-behaviours, higher prevalence of car accidents and higher rates of jail time (Hirsch et al., 2018). Additionally resulting in developing maladaptive coping strategies, poor self-esteem and lead to reduced quality of life for women (Attoe & Climie, 2023; Holthe et al., 2017; Oerbeck et al., 2015).

Research investigating the complex relationship between ADHD, pain sensitivity and pain disorders, is growing (Battison et al., 2023). In a population of acute pain patients, Brown et al. (2025) found individuals with increased ADHD symptoms and pain catastrophising were more at risk of chronic pain interference following their injury or surgery at a six month follow up appointment. Although a small, correlational study, it asks an important question about the relationship between ADHD and pain experiences. Similar results were found in a correlational study of the general population by Stickley et al. (2016), suggesting higher rates of ADHD symptoms in adults were associated with an increased risk of experiencing pain. Although there are some limitations, ADHD was not clinically diagnosed, and pain interference with work was measured by a single item, and while no causal data can be gained, it does contribute to the evidence that further research is needed to explore the link between ADHD and pain. The presence of ADHD may be significant to dysmenorrhea sufferers due to the role that attention plays in pain processing (Battison et al.,

2023), and persistent pain is known to diminish cognitive ability, further exacerbating symptoms of ADHD.

Increasingly, it is being hypothesised that dysregulation of dopamine in the frontal and pre-frontal cortex is of interest to the link between ADHD and altered pain perception (Treister et al., 2013), with a potential link to neuroinflammation that can affect synaptic function being involved in pain sensitisation (Kerekes et al., 2021), however these studies are still in the early stages. The role of attention and pain is closely related, and multi-faceted, in that attentional bias (negative thoughts and catastrophising) towards pain is known to increase pain sensitivity (Keogh & Cochrane, 2002). Whereas distraction, or selective attention, such as a cognitive task is known to decrease felt pain experiences (Rischer et al., 2020). Additionally, pain experience is known to influence attentional capabilities (Brown et al., 2025), like performing a cognitive task or executive function. This may be particularly relevant to female populations as ADHD inattentive type is more prevalent in women (Hinshaw et al., 2021), and a core symptom of ADHD is interruption to executive function. Researchers suggest there are some shared neural systems that are disrupted in both ADHD and pain perception (Battison et al., 2023; Kerekes et al., 2021; Treister et al., 2015).

#### 1.4 Emotion Regulation

A common and persistent symptom of ADHD that significantly contributes to impairment across life domains is emotion regulation difficulties (ERD) (Christiansen et al., 2019; Hirsch et al., 2018). Emotion regulation involves how individuals control, experience, and express emotions, manage behaviour, and cope with stress (Hirsch et al., 2018). ERD has been linked to various poor health outcomes, crucially, heightened pain perception, particularly in chronic pain conditions, (Koechlin et al., 2018). Potentially due to the

attentional attributes in maladaptive emotion regulation strategies that increase pain perception in chronic pain sufferers (Solberg et al., 2009) such as emotion suppression, catastrophising, and rumination.

Koechlin et al. (2018) found that individuals with chronic pelvic pain exhibited more thought suppression than control groups, resulting in increased pain and pain vulnerability. Reduced emotion regulation strategies led to increased negative emotions, reduced cognitive reappraisal of emotions, and experiencing increased pain. So, those with fewer emotion regulation resources will experience pain more intensely, and struggle to switch their attentional focus, (Christiansen et al., 2021). Accordingly, ERD can lead to an inability to suppress ruminating thoughts (about pain) and affect mood regulation (Solberg et al., 2009), therefore exerting more psychological distress and increasing impairment in chronic pain patients. In a cross-sectional study of women with endometriosis, physical pain and ERD were negatively associated with health-related quality of life (HRQoL) (Marki et al., 2017), however, due to the nature of the chronic pain disorder, these findings cannot be generalised beyond this population. To further explain the influence of ERD on pain processes, chronic pain studies need to include emotion regulation in their investigations (Koechlin et al., 2018)

Attentional and emotion regulation deficits are key features of adult ADHD (Hirsch et al., 2018; Shaw et al., 2014). Hirsch et al. (2018) identified emotion regulation to be a distinct symptom of ADHD in adults resulting in significant impairment to different life domains. Evidence supports that ADHD and ERD can lead to reduced quality of life (QoL) (Ben-Dor Cohen et al., 2021) which suggests that ADHD and poor emotion regulation skills has a negative impact for individuals. Although others express caution as ERD in ADHD populations may be due to other comorbid disorders or life stage development (Sibley et al., 2020), and while it is currently not included in the DSM 5 diagnostic criteria (Sibley, 2021), it

is strongly argued that ERD in ADHD is prevalent without comorbidity, and consistent over time (Christiansen et al., 2019).

Both ADHD and ERD have been linked to increased pain sensitivity and pain intensity, studies have found lower pain thresholds in individuals with ADHD (Treister et al., 2015) and high ERD (Bruton et al., 2023) meaning that individuals with ADHD or ERD are more at risk of experiencing heightened pain sensitivity compared to other populations.

A large Swedish study found a higher comorbidity of psychiatric disorders in women with endometriosis, including a higher prevalence of ADHD than in a general population (Gao et al., 2020). A strength of the study was its large, longitudinal sample from Swedish national registers. By considering family information, heritability factors of the disorders were controlled for, but this alone could not fully explain the differences seen in the population of endometriosis patients. Potentially, the study has not captured a full picture of endometriosis patients, as it typically takes an extremely long time for diagnosis, according to NHS England (2024), more than eight years. The data was taken from hospital records so that does not include individuals with the condition who have not engaged with medical care or who are not yet diagnosed. However, it did create a starting point to warrant further investigation into the link between ADHD and dysmenorrhea.

One initial study investigated the possible link between ADHD and Primary Dysmenorrhea in adolescent girls (n=209) enrolled as outpatients in a child and adolescent psychiatric polyclinic in Turkey (Kabakcu et al., 2021). They compared two groups of participants, one with dysmenorrhea symptoms that affected daily activities, and the other group having dysmenorrhea that did not affect daily activities. The findings supported the hypothesis, that increased MSS was correlated to increased ADHD symptom severity and the group that experienced interruptions to their daily activities due to dysmenorrhea had higher

levels of inattention, impulsivity and hyperactivity. Attention is well known to be impacted by the effects of pain, and this is consistent with other findings, that sufferers of chronic pain disorders are more likely to present deficits in attention (Battison et al., 2023).

Kabukcu et al. (2021) report this as a novel finding stating this as the first reported study drawing a link between dysmenorrhea and ADHD. Although previous research has investigated pain and ADHD, there has been fewer studies conducted in female populations, with specific reference to dysmenorrhea. Almost half of the participant sample (49.8%) reported menstrual symptom severity disrupting their daily activities, and the group with menstrual symptoms interrupting daily activities were found to have increased psychological distress leading to adverse effects on participants quality of life. Although, some caution is necessary when considering the findings. The sample of participants were recruited through a child and adolescent psychiatric outpatient clinic at a university hospital, the age range of participants is 13-18, in a clinical population and therefore should not be generalised to a community or adult population. Dysmenorrhea symptoms are more intense and frequent in an adolescent population and severe symptoms are more prevalent within the first two years of menarche (Ju et al., 2014), age is a potential confounding factor ( $M=15.47$ ), and dysmenorrhea scores may be increased in the current study compared to an adult population. Furthermore, it is known that psychiatric disorders, such as anxiety and depression, and negative emotions are related to pain sensitivity and chronic pain disorders (Keochlin et al., 2018), therefore a sample from a psychiatry clinic may have a heightened propensity to experience more severe pain, and that the interaction between psychiatric disorder, pain experience and the associated impact on daily activity and quality of life may be too complex to unravel (Keogh & Cochrane, 2002). The measure of ADHD was considered to be a strength of the study, using the DSM IV in a clinical interview with a qualified practitioner.

Within this study, a number of inferences were suggested to explain the connection between dysmenorrhea and ADHD, regarding the biological mechanism that may link the two. Suggesting the interruption of neurological dopamine pathways could explain the correlation between increased menstrual pain and increased ADHD symptoms, however, it should be clear that this study reported only correlational data and therefore no causal results can be drawn from this current study. Yet it makes an important contribution in which future research can consider the relevance of ADHD and dysmenorrhea and the potential comorbid occurrence.

In a study of adult primary dysmenorrhea (PD) patients (no underlying pelvic condition), Sagsoz et al. (2021) investigated the relationship between ADHD and PD. Using the ADHD adult self-report scale (ASRS) to measure ADHD symptoms, they found significantly higher mean ADHD scores in the PD group when compared to a control group suggesting a higher prevalence of ADHD in PD group. Alternatively, it could be considered that chronic pain (PD) leads to increased ADHD symptoms of inattention and impulsivity, as the patients in this sample did not have an ADHD diagnosis from a practitioner and the data collected was correlational (Battison et al., 2023). It is also worth considering if this is short lived during chronic pain episodes when experiencing dysmenorrhea, or a consistent presentation of ADHD symptoms.

Decreased quality of life scores, using the Short Form Health Survey (SF-36), were associated with increased ADHD scores in this current study which indicates that worsened ADHD symptoms are linked to impaired general health-related quality of life (HRQL). Significantly lower HRQL was found in the PD group compared to the control group suggesting that PD is also linked to reduced quality of life through health domains of the SF-36. The study is a small participant sample ( $n=114$ ), with 62 PD patients and 52 in the control group, the participants were a young adult sample ( $M=21.24$ ) and menstrual symptom

severity is known to decline with age, which could suggest different results would be seen in an older population. Recruitment occurred in a clinical population so results cannot be generalised, however it does outline clear differences between PD sufferers and a general population. More research is needed to inform ADHD and PD screening and treatment to inform clinicians, and improve HRQL.

A richly detailed qualitative study was carried out to explore the lived experiences of women with ADHD and their perceived associations between ADHD and the menstrual cycle by Burger et al. (2024). Semi-structured in-depth interviews were carried out with 10 participants, recruited via social media channels, the thematic analysis that was conducted on the data produced insightful findings on a relatively unknown topic area. Due to the infancy of the research there is little theory to provide background or supporting evidence, although in chronic pain studies, it is suggested that cognitive-affective models of pain can explain how cognitive abilities, such as executive function are negatively impacted because of interruption to attentional processes (Battison et al., 2023). It could be inferred that this can further exacerbate existing ADHD symptoms, but further neuroscience studies are needed to provide evidence in support of the cognitive-affective model of pain.

The present study was a well conducted, qualitative research, with a suitable number of participants with robust ethical consideration and sensitivity for the participants and subject matter (Braun & Clarke, 2006). The main themes identified were, Changes of ADHD throughout the menstrual cycle, Experiences with a healthcare provider, and Menstrual health management. Important findings from this study state, ADHD symptoms are reported to be more severe during the mid-luteal phase (the days before menstruation) and the menses phase of the menstrual cycle. This suggests that there are changes and fluctuations in ADHD symptoms for women with ADHD that are being perceived by women to be during hormonal changes.

Noticeable difficulties included executive dysfunction such as task initiation and task switching, emotion dysregulation, particularly irritability, sadness, anxiety, sensitivity and hopelessness, and attention dysregulation, struggling to concentrate, stay focused, increased forgetfulness and disorganisation. Reduced well-being was discussed, with reference to the impact on interpersonal relationships, goals and motivation, and careers, with severe menstrual symptoms and ADHD symptoms severely affecting QoL. This has been reflected in other studies (Iacovides et al., 2014; Sagsoz et al., 2021) where severe PD led to reduced QoL, and PD patients with high ADHD symptoms had lower QoL, therefore implying that the qualitative findings are supported.

One encouraging finding suggested that medical professionals are beginning to recognise the associated links between ADHD and menstrual phases as discussed by one participant, however many others are still feeling dismissed, and therefore more research is necessary to provide a wealth of information on this topic for individuals and medical staff to support menstrual health management. One potential limitation of the study is participant recruitment via social media, as this may result in data bias as the participants willing to participate may be individuals who have an interest in the subject due to their own health struggles.

Further research that explored associations between ADHD symptoms, emotion regulation skills, dysmenorrhea and psychological well-being includes a recent study by Lockinger and Gagnon (2023). Multiple regression analysis was used to explore the data from the participant sample of adult women in North America and Canada (n=266) with a self-reported diagnosis of ADHD. They draw conclusions that women with ADHD experience additional challenges beyond the core symptoms of ADHD, such as dysmenorrhea and ERD, from reporting a high comorbidity of menstrual pain in their sample of ADHD women (95%). This is an increase from other studies that suggest lower levels of prevalence, Unsal et al.

(2010) reports PD rates of 72.7%, and in a meta-analysis Wang et al. (2022) reports 66.1% of Chinese students report dysmenorrhea. Data from the World Health Organisation (WHO) states that dysmenorrhea rates vary widely, between 16-91%, and Lockinger and Gagnon (2023) results exceed this. Additionally, ADHD symptom severity, measured with the ASRS, was positively correlated with dysmenorrhea severity, meaning that there is an unexplained relationship between ADHD symptoms and dysmenorrhea that influence one another, similar to findings by Sagsoz et al. (2021).

As there was no data on ADHD diagnosis, the use of a self-report ADHD symptom score is considered a strength of the study, however there were multiple scales used within the study and as the study time increases there is risk of participant fatigue and high dropout rate, but online recruitment can benefit data collection and sensitive data handling (Kilinc & Firat et al., 2017).

A significant association between ADHD symptoms and psychological wellbeing was reported however, due to a range of confounding variables involved, such as high rates of anxiety and depression and low self-esteem, late diagnosis and reduced coping strategies for women with ADHD, it is difficult to disentangle the comorbid psychological factors (Hinshaw et al., 2021; Holthe et al., 2017).

A surprising finding of the study was that although high levels of emotion dysregulation were found in the participant sample, ERD did not have a moderating effect on ADHD symptoms and dysmenorrhea symptoms. This is unexpected as ERD have been found to influence both ADHD symptoms (Hirsch et al., 2018), and pain perception (Koechlin et al., 2018). Some explanations have been suggested to explain the results, such as dopamine dysregulation, which is known to be a key factor for both ADHD and pain sensitivity (Treister et al., 2013; Kerekes et al., 2021), and the role of disrupted attention in chronic pain and

ADHD (Brown et al., 2025), however the data is correlational and therefore no causal information can be stated.

The study differs from previous studies as it utilises a general population sample, due to the nature of recruitment, via social media. However, that means there is a potential for participant bias as those who sign up are part of online ADHD communities and forums, and therefore may have increased ADHD and dysmenorrhea symptoms compared to those who do not take part and so may not be fully representative of a general population sample. Furthermore, the study has not included a control group of participants without ADHD for comparison of dysmenorrhea and psychological wellbeing scores.

### 1.5 Hypotheses

The aim of the current study is to address a gap in the literature by investigating a participant sample of adult women, both with, and without an ADHD diagnosis, with the inclusion of levels of emotion regulation difficulties (Koechlin et al., 2018). The study will explore any associations by measuring menstrual symptom severity and quality of life domains in a general population of university students (Sagsoz et al., 2021).

After reviewing the previous empirical research, it is expected that there will be a significant difference of MSS and QoL between the ADHD and no ADHD group (Lockinger & Gagnon et al., 2023).

$H_1$  It is expected that there will be an increase in MSS and decreased QoL for the women with an ADHD diagnosis.

$H_0$  There will be no difference in MSS and QoL between women with an ADHD diagnosis and women without an ADHD diagnosis.

Previous literature highlights that emotion regulation influences pain perception and therefore the current study expects to find a significant difference between emotion regulation levels on MSS and QoL.

$H_2$  Women with high emotion regulation difficulties will experience increased MSS and lower QoL satisfaction scores.

$H_0$  There will be no differences between levels of emotion regulation and MSS or QoL.

There have been mixed findings on the interaction effects of ADHD and emotion regulation, however, based on the limited research it is expected there will be an interaction effect on MSS and QoL.

$H_3$  There will be a significant interaction between ADHD and emotion regulation levels which will have an influence on MSS scores and QoL.

$H_0$  There will be no interaction effect between ADHD and emotion regulation levels found to impact MSS and QoL.

## **Chapter 2 - Method**

### **2.1 Participants**

A sample of students from the psychology department at UWTSD were recruited via the university Experiment Management System (EMS) for the current study,  $n = 95$ . The inclusion criteria stated for female participants, over the age of 18 and still experiencing a menstrual cycle, participants ranged in age between 19 – 53,  $M \text{ age} = 32.02$  and  $SD = 10.21$ .

The target population for this study was an adult, female student population to include students with an ADHD diagnosis ( $n=16$ ) and without an ADHD diagnosis ( $n=79$ ). Participants were further categorised into two levels of Emotion regulation difficulties (ERD), ERD high ( $n = 48$ ), and ERD low ( $n = 47$ ).

**Table 1.**

*Participant Descriptive Statistics of the IV groups*

| Independent variable<br>group | N  | %     | Independent variable<br>group | N  | %     |
|-------------------------------|----|-------|-------------------------------|----|-------|
| ADHD Yes/ERD Low              | 4  | 25    | ADHD No/ERD Low               | 43 | 54.43 |
| ADHD Yes/ERD High             | 12 | 75    | ADHD No/ERD High              | 36 | 45.57 |
| Total                         | 16 | 16.84 | Total                         | 79 | 83.16 |

The above table describes the participant frequencies and percentages of the four independent variable (IV) groups, two IV's (ADHD presence and ERD) with two levels (ADHD yes/no and ERD high/low), which become ADHD yes/ERD low, ADHD yes/ERD high, ADHD no/ERD low, ADHD no/ERD high. It can be seen that participants with ADHD accounted for 16.8% of the total participant sample, and of the 16 participants with ADHD, 25% of them were categorised in the low ERD group and 75% into the high ERD group. In

the group of 79 participants with no ADHD diagnosis, 54.4% were categorised into the low ERD group, and 45.6% were assigned to the high ERD group. Further demographic information collected for the ADHD participant sample only, included if they are currently taking a prescribed ADHD medication, and at what age they received an ADHD diagnosis. In the current population of ADHD participants, four of the 16 individuals (25%) reported taking a prescription medication for their ADHD symptoms. The mean age of ADHD diagnosis for the ADHD group is  $M = 29.06$ .

## **2.2 Design**

The current study utilises an experimental between-subjects factorial design and a two-way MANOVA was conducted to analyse the data. The first of the two categorical independent variables (IV) is ADHD presence, categorised into two levels, No ADHD diagnosis (no), ADHD diagnosis (yes). The second IV is Emotion regulation difficulty (ERD), categorised into two levels, ERD low, and ERD high. The ERD high group was categorised by a median score (47.00) and above on the Difficulty of Emotion Regulation scale (DERs), and a score below the median (46.00 or less) was categorised as ERD low, in line with suitable, suggested methods for creating categorical groups from continuous data (Rucker et al., 2015). The two dependent variables in the current study are Menstrual symptom severity (MSS) measured by a 30 item scale to obtain a combined symptom severity and intensity score; and Quality of Life (QoL) measured by a 16 item scale identifying general life domains satisfaction.

Participants were asked to complete the self-report measures in an online questionnaire format via Qualtrics where the data was collected. The data was analysed using SPSS to answer the research questions which investigate the main effects of ADHD presence

and ER difficulties on MSS and QoL, and further explores the interaction effects of each variable group.

### **2.3 Materials**

Recruitment was via an online advert on the university EMS, full information of the study purpose and participation criteria were given through the electronic information sheet (**See Appendix A**), including outlining the topics and nature of the study, and what participants will be asked to do. Informed consent was requested on the electronic consent form (**See Appendix B**) if they were happy to continue and participate in the study. The first questionnaire was the demographic form (**see Appendix C**) which collected age, ADHD diagnosis (yes/no), age at diagnosis if applicable, and current ADHD medication (yes/no). Participants were then grouped into either the ADHD yes group or ADHD no group.

The following scales were presented to all participants to complete as an online self-report questionnaire. The first was the Difficulty in Emotion Regulation Scale (DERS-16) (Bjurberg et al., 2016), a 16 item scale using a 5-point likert scale for participants to indicate to what extent each statement applies to them, almost never (1), sometimes (2), about half the time (3), most of the time (4), almost always (5) (**See Appendix D**). Each item is scored 1-5 and the total calculated giving a range between 16-80. The DERS-16 measures across 5 subscales, Emotional clarity (items 1,2), Goal directed behaviour, (items 3,7,15), Impulse control, (items 4,8,11), Emotional Strategies, (items 5,6,12,14,16), and Nonacceptance of behaviour, (items 9,10,13). Each individual sub-scale score can be calculated by totalling the items and dividing to find the mean score. A Cronbach's alpha for internal consistency was excellent ( $\alpha = .95$ ) suggesting that 16-items a highly reliable measure.

The Menstrual Symptom Severity Scale (**see Appendix E**) utilised an adapted, reduced version of the Menstrual Distress Questionnaire (MEDI-Q) (Vanuccini et al., 2021) to gain an overall severity of menstrual symptoms score. This resulted in a 15-item scale with three possible responses – No (0), Yes – less than half the time (1), Yes – more than half the time (2) to obtain a frequency of symptoms score. With a further 15 item follow up question asking to what extent the symptom interfered with your QoL, usual activities and relationships, using a 4 point likert scale – not at all (0), a little (1), moderately (2), very (3) to obtain a severity score. At the time of importing the dataset from Qualtrics to SPSS for analysis, the scoring was adjusted so that symptom frequency reporting became 1-3 for no, yes – less than half the time, and yes more than half the time with a score range of 15 (No MSS)-45(High MSS). The symptom severity impact was measured from 1-4, not at all, a little, moderately and very with a score range of 15 (low impact) – 60 (high impact). The two scores (frequency and severity) are then added together for a total menstrual symptom severity (MSS) score with a range between 30 – 105, with a higher score indicating increased menstrual symptom prevalence and severity. Items that were considered irrelevant to the study or distressing to the participants were removed. Reliability tests have been conducted to assess the internal consistency and validity of the scale. The internal consistency of the 30 item MSS scale was reported as excellent ( $\alpha = .94$ ).

The 16 item Quality of Life Scale (QoL) (Burkhardt & Anderson, 2003) that measured satisfaction across six life domains using a 7-point likert scale from delighted (7) - terrible (1) (**see Appendix F**). The total score ranged from of 16-112 with a higher score indicating greater satisfaction with quality of life. The six life domains measured from this QoL scale include material and physical well-being, relationships with other people, social community and civic activities, personal development and fulfilment, recreation, and independence. A

Cronbach's alpha value ( $\alpha = .84$ ) for the 16 item scale found good internal consistency and reliability.

Participants were given an electronic debrief following completion of the study which detailed the purpose of the current study further and gave participants an opportunity to discuss their involvement should they wish to (**See Appendix G**).

A password protected laptop was used to run the IBM SPSS software programme, version 29. A two-way between-subjects MANOVA was used to analyse the collected data for the current research.

## **2.4 Procedure**

An initial study proposal was accepted (**see appendix H**) before submitting an application to the UWTSD ethics panel for full ethical approval in line with the BPS code of human research ethics (BPS, 2021). Full ethical approval was granted for the current study ahead of the study commencement (**See appendix I**). Further supported by the BPS Code of Ethics and Conduct (BPS, 2021), and UWTSD Research Ethics and Integrity Code of Practice (2022), the researcher adhered to professional integrity, throughout the study process, to protect the rights and dignity of the participants involved. A risk assessment was conducted to ensure that the study met all of the required ethical standards to protect the safety, integrity, confidentiality, and to minimise potential harm to both the participant and the researcher. This included further consideration for Guidelines for Internet-Mediated studies (BPS, 2021), such as the lack of control for the researcher to react to participant feelings and mood during the study, therefore information on how and where to seek appropriate advice was included in the study information.

Participants were recruited through the university EMS and following sign up to the study, first received the electronic study information sheet outlining the research area and survey details. Participants were reminded of their right to withdraw from the study at any point up until their data had been submitted and anonymised, without consequence (BPS, 2021). Informed consent was gained via an online electronic consent form. Once consent was given, participants were directed to begin the study, first to the demographic information followed by the study questionnaires containing the 3 scales. Once the study was completed and submitted, participants were directed to the electronic debrief sheet which gave further details regarding the nature of the study, the researcher and supervisor contact information and signposting to appropriate health information. Participants received further reassurance that data collection and storage would remain private and anonymous and were thanked for their time and for participating in the study via the debrief sheet. The study was completed in approximately 15 minutes and study credit was granted for their participation.

All data collection and storage adhered to the strict confidentiality and privacy policies governed by the Data Protection Act (2018). After the data collection was complete, the dataset was exported from Qualtrics and input into SPSS. The data was cleaned and screened, and participants with missing data were removed from the dataset. Where there was a singular missing item datapoint for a participant, or missing data of 10% or less, a participant mean calculation of the subscale was used to input missing information, so that the sample size was not too greatly affected (Parent, 2013). The scale scores were totalled, and the Emotion Regulation Difficulty levels were categorised into two groups, high, and low levels, by finding the median score (47.00) of the DERS (Rucker et al., 2015). 49.50% were assigned to the low DER group with a score of 46.00 or lower, and 50.5% were assigned to the high DER group with a score of 47.00 or more. Preliminary tests were conducted to assess the validity and reliability of the scales by using the Cronbach alpha function. Further testing was carried

out to check that the data met all the assumptions required before conducting a two-way MANOVA to investigate the study hypotheses.

### **Chapter 3. – Results**

A two-way between-groups Multivariate analysis of variance (MANOVA) was conducted to investigate if there were differences between the main effects of the independent variables, ADHD presence (yes/no), and Emotion Regulation Difficulty (ERD) Levels (high/low) on the dependent variables, Menstrual Symptom Severity (MSS) and Quality of Life (QoL), as well as exploring any interaction effects between the variable groups.

**Table 2.**

*Descriptive Statistics –Total Frequencies, Means and Standard Deviations for the Separate Independent Variable Levels*

| Independent variables | Menstrual symptom severity |       |       | Quality of life |       |
|-----------------------|----------------------------|-------|-------|-----------------|-------|
|                       | N                          | M     | SD    | M               | SD    |
| Total No ADHD         | 79                         | 63.13 | 16.50 | 49.94           | 12.40 |
| Total Yes ADHD        | 16                         | 70.94 | 16.38 | 51.81           | 15.18 |
| Total ERD low         | 47                         | 57.81 | 13.97 | 47.32           | 12.39 |
| Total ERD high        | 48                         | 70.94 | 16.38 | 53.13           | 12.74 |

Table 2. displays the total of the frequencies, means and standard deviations in each level of the Independent variable groups for the dependent variables of MSS and QoL. It shows that the mean scores for menstrual symptom severity (MSS) were higher overall for the ADHD group (70.94) compared to the women with no ADHD diagnosis (63.13). Increased MSS scores were also seen in the high Emotion Regulation Difficulty (ERD) group (70.94) when compared to the low ERD group (57.81).

QoL satisfaction scores were highest in the ERD high group (53.13), and lowest in the ERD low group (47.32), showing that the ERD group had the most variance in QoL scores. Little variance was seen between the QoL scores of women with or without ADHD, but there was a marginally lower mean QoL satisfaction score for women without ADHD (49.94) when compared to women with ADHD (51.81).

**Table 3.**

*Descriptive Statistics Variable Interactions, Frequencies, Means, and Standard Deviations.*

| Independent variables |                                 | Menstrual symptom severity |       |       | Quality of life |       |
|-----------------------|---------------------------------|----------------------------|-------|-------|-----------------|-------|
| ADHD presence         | Emotion regulation difficulties | N                          | M     | SD    | M               | SD    |
| No                    | Low                             | 43                         | 57.44 | 14.07 | 46.77           | 11.67 |
|                       | High                            | 36                         | 69.92 | 16.40 | 53.72           | 12.33 |
| Yes                   | Low                             | 4                          | 61.75 | 14.06 | 53.25           | 19.87 |
|                       | High                            | 12                         | 74.00 | 16.63 | 51.33           | 14.33 |

Table 3. shows that the highest recorded mean scores of MSS were for the group with ADHD and high ERD (74.00) when compared to all other groups, and the lowest MSS mean scores were found in the no ADHD/low ERD group (57.44). Very little differences were seen between the Quality of Life (QoL) mean scores of the participants with ADHD, and the no ADHD/high ERD group. The lowest recorded QoL satisfaction scores were found in the no ADHD/low ERD group (46.77).

Preliminary testing for normality, linearity and multivariate outliers were conducted prior to analysis and all assumptions were met without violation. The Shapiro-Wilk test was selected as the best fit for the sample size (Mishra et al., 2019) to test for normal distribution of the two dependent variables, MSS and QoL. For MSS,  $W(95) = .98$ ,  $p = .29$ , and for QoL  $W(95) = .99$ ,  $p = .33$ , based on this it can be reported that it did not show evidence of non-

normality, and normal distribution assumptions were met. To test for multivariate outliers Mahalanobis distance was calculated (8.71) and this did not exceed the critical value of 13.82, suggesting there are no multivariate outliers within the dataset. The Box's M Sig. value is .87 which shows that the assumption of homogeneity of variance-covariance has not been violated. Levene's test of equality of variance is a non-significant result, (MSS,  $F(3,91)=.35$ ,  $p = .79$ , QoL  $F(3,91)=.86$ ,  $p = .46$ ) and therefore, presents no assumption violation.

Following the preliminary tests where all assumptions were met, the two-way MANOVA was conducted to test the hypotheses. The Wilks Lambda has been selected for reporting the results because there were no violations to the assumptions (Patel & Bhavsar, 2013) and therefore statistically robust.

It was hypothesised that women with an ADHD diagnosis would experience increased MSS scores, and, as a result of ADHD presence and increased MSS, would have lower QoL satisfaction scores. The main effect of ADHD presence on MSS and QoL was found to be non-significant, Wilks  $\Lambda = .99$ ,  $F(2,90) = .44$ ,  $p = .64$ ,  $\eta^2 = .01$ , and therefore the null hypothesis was accepted. A significant main effect of ERD levels on the combined dependent variables was reported following the multivariate test, Wilks'  $\Lambda = .93$ ,  $F(2,90) = 3.35$ ,  $p = .04$ ;  $\eta^2 = .07$ , and the null hypothesis was rejected, therefore it can be stated that differences in ERD impact the MSS and QoL experienced by an individual. The results of the interaction effect between ADHD presence and ERD levels revealed a non-significant finding, Wilks  $\Lambda = .99$ ,  $F(2,90)$ ,  $p = .52$ ,  $\eta^2 = .01$ , and the null hypothesis cannot be rejected, suggesting that the current study cannot support an interaction between emotion regulation and ADHD that can explain differences in MSS and QoL.

Further testing was carried out with a univariate between-subjects ANOVA to test the hypothesis that high emotion regulation levels will significantly increase MSS and lower QoL.

It revealed that ERD levels were only found to significantly affect MSS scores,  $F(1,91) = 6.77$ ,  $p = .01$ ,  $\eta^2 = .07$ , suggesting that individuals with high ERD were more likely to experience increased menstrual symptom severity. Further investigation revealed that ERD levels had a non-significant effect on QoL  $F(1,91) = .42$ ,  $p = .52$ ,  $\eta^2 = .01$ . The ANOVA further confirmed that the significant result of ERD on MSS was independent of ADHD presence, and ADHD presence on MSS and quality of life was found to be a non-significant result

## **Chapter 4. – Discussion**

The purpose of this study was to investigate the associations of ADHD presence and levels of emotion regulation difficulties, and their impact on menstrual symptom severity and quality of life domains in a student population of women. Adult women with an ADHD diagnosis were compared to women without ADHD to measure differences in MSS and QoL. For both MSS and QoL, a non-significant result was reported which means that  $H_1$ , women with an ADHD diagnosis will have increased MSS and reduced QoL, was rejected and cannot be supported. It was hypothesised that levels of emotion regulation would have a significant impact on MSS and QoL,  $H_2$  stated that high ERD would lead to increased MSS and impaired QoL, this hypothesis was accepted.  $H_2$  was supported and found that high ERD resulted in significantly higher MSS in the current study. However, the influence of high ERD on QoL was not supported in the follow up analysis meaning that QoL was not impaired due to ERD. Lastly, the interaction effect of ADHD presence and emotion regulation levels on MSS and QoL was found to be non-significant and therefore  $H_3$  could not be accepted.

This study reports that ERD significantly effects MSS and supports the literature that suggests women with high ERD experience significantly worse menstrual pain symptoms compared to women with low ERD. Although there are limited findings in studies of dysmenorrhea and ERD, it is consistent with Marki et al., (2017) that identified ERD as a predictive factor of increased pain in a study of women with endometriosis. In addition, that negative mood alters pain perception and limits the ability to cope with chronic pain, as shown in the current study. However, in contrast with this study, Lockinger and Gagnon (2023) measured ERD using the DERS, and did not report that ERD had a significant moderating effect on MSS for women with ADHD, which was not expected but is perhaps

explained by the participant sample being an ADHD only population with limited ER coping strategies (Holthe et al., 2017).

The current study is consistent with chronic pain studies, where links with emotion dysregulation and increased pain have been reported (Koechlin et al., 2018). Persistent pain such as chronic pain is known to diminish cognitive ability due to attentional focus and negative mood, which is also likely to decrease emotion regulation capabilities, which could explain why those with more severe MSS were categorised in the high ERD group and give an explanation for the current findings.

Therefore, ERD can be thought of as a risk factor for dysmenorrhea, whereby increased negative mood and maladaptive emotion regulation strategies can negatively impact pain experiences during the menstrual cycle. If the Process Model of Emotion Regulation is considered, it suggests that an individual with poor emotion regulation skills is unable to shift their attentional focus from the situation (menstrual pain), have limited cognitive reappraisal tools, and their response to the event remains a more negative outcome (Koechlin et al., 2018) consequently increasing pain intensity. This describes the inability to shift attentional focus and ruminating seen in chronic pain disorders (Brown et al., 2025; Solberg et al., 2009), and may explain the poorer pain outcomes seen in the MSS scores. From these findings it could be inferred that emotion regulation skill training may reduce pain sensitivity in dysmenorrhea, and lead to reduced MSS and increased engagement in daily activities in line with previous studies that found emotion regulation interventions have been shown to significantly improve pain sensitivity (Haspert et al., 2020).

It cannot be stated that there is a difference in menstrual symptoms or QoL for women with ADHD compared to women without an ADHD diagnosis in the current study, this differs to previous studies that report increased dysmenorrhea symptoms for women with ADHD

(Lockinger & Gagnon, 2023; Sagsoz et al., 2021), and decreased quality of life in ADHD populations (Sagsoz et al., 2021; Agarwal et al., 2022). However, from the descriptive statistics and mean scores for MSS, a clear trend has been shown in the recorded data as seen in Table 2. The MSS mean scores for women with ADHD were reported as higher than for women without ADHD, suggesting that some women in the current study with ADHD have experienced increased MSS. Although the current study had a non-significant finding for ADHD and MSS, the apparent statistical trend is worth exploring further.

Previous studies that found increased dysmenorrhea symptoms for women with ADHD utilised the Adult ADHD Self-report Scale (ASRS) to measure levels of ADHD symptoms where ADHD diagnosis information was not available, or self-reported (Lockinger & Gagnon, 2023; Sagsoz et al., 2021). It could be suggested that increased ADHD symptoms that impair executive function, interrupt attention processes, and display higher emotion dysregulation, correlates to increased MSS, and simply the presence of ADHD is not influential in an isolated context. This is further corroborated by ADHD and chronic pain studies that measured ADHD using the six item ASRS, and found increased ADHD symptoms were correlated with increased pain experience for adults in a general population (Brown et al., 2025; Stickley et al., 2016). Alternatively, in a study of Chinese school students, using the ASRS to measure ADHD symptoms, Yuan et al. (2024) did not find ADHD symptoms were linked to menstrual pain. Taken together with the findings from the current study, the association between ADHD and MSS should be considered to have mixed results.

Research indicates that the prefrontal cortex (PFC) is important in the role of pain processing (Ong et al., 2018), and it is well recognised that ADHD is affected by, and characterised by, disruption to neural systems within the PFC (Arnsten, 2009). Additionally, experts state that delayed development of the PFC (Antoniou et al., 2021) is common to ADHD and so it could be inferred that it is through impairments within the PFC that there is a

link between ADHD symptoms and pain perception (Kerekes et al., 2021) including increased MSS, however that is beyond the scope of the current study.

It is important to add that ADHD in women is underreported and underdiagnosed, and often late diagnosed in adulthood compared to a male presentation of ADHD (Attoe & Climie, 2023; Holthe et al., 2017). This is a consistent finding of the current study as mean age of ADHD diagnosis was reported as 29.06. Therefore, it is possible that some of the participants categorised as no ADHD diagnosis may have some ADHD symptoms or be undiagnosed at present, meaning that there may not be a full picture of the effect of ADHD on MSS in the current study. Equally important is the ADHD subtype within the female ADHD diagnosis, as women with ADHD are more commonly diagnosed with the inattentive type presentation (Antoniou et al., 2021) which often contributes to the lack of diagnosis as it is not recognised by professionals, parents, or peers. Inattentive type ADHD is linked to the role of attention, over hyperactivity and impulsivity, which is further highlighted within pain perception studies as having a worsening effect, due to catastrophising and increased negative thoughts leading to an increase in pain experiences (Keogh & Cochrane, 2002; Rischer et al., 2020). The current study did not collect data on ADHD subtype which may have further explained why there was no significant finding reported. Furthermore, it did not collect data on the stage at which the participant was in their menstrual cycle when completing the study. This may be relevant as research has shown that ADHD symptoms fluctuate throughout the menstrual cycle (Antoniou et al., 2021; Burger et al., 2024; Eng et al., 2024) meaning that ADHD symptoms are dynamic and have been linked to hormonal changes (Antoniou et al., 2021) which suggests there is a relationship between menstrual symptoms and ADHD symptoms.

A possible confounding variable in the current study is the age of the participant sample, even though it is a student participant group, the mean age reported (32.02) is

significantly older than previous research studies with a student population (Sagsoz et al., 2021; Unsal et al., 2010; Wang et al., 2022). Dysmenorrhea symptoms are known to decline as age increases (Ju et al., 2014; McKenna & Fogleman, 2021) which may explain lower levels of MSS scores being recorded in the current population. Despite this, the results for MSS show a clear trend in the means scores for the ADHD diagnosis group compared to the no ADHD group. This does suggest a difficulty within the study as younger participants may experience increased MSS compared to an older population, however due to the average age of receiving an ADHD diagnosis for women, a younger population may contain undiagnosed ADHD women within the no ADHD category (Attoe, & Climie et al., 2023; Holthe et al., 2017).

The current study considered an interaction effect between ADHD and ERD on MSS and QoL which was found to be non-significant. This result was unexpected because ERD, which was found to have a significant impact on MSS scores, is known as a key factor of ADHD symptoms (Hirsch et al., 2018). ERD has been widely reported to be a consistent presentation for women with ADHD (Christiansen et al., 2019) and it was therefore expected to see an interaction between ERD and ADHD on MSS and QoL. It must be noted that the current study reported a much higher percentage of women with ADHD to also have high ERD (75%), when compared to the women without ADHD in the high ERD group (45.57%). Based on these findings, it is fair to say that there is much more to understand about the interaction between ADHD and ERD resulting in the need for further investigation into the complex relationship between ERD, ADHD and chronic pain (Petrovic & Castellanos et al., 2016). This further suggests that emotion regulation should be included in future ADHD and pain perception studies (Koechlin et al., 2018).

The most unexpected findings from the current study regard the non-significant findings in all variable interactions with QoL. This is surprising when compared to previous

literature on ADHD and QoL, ERD and QoL and Dysmenorrhea. There is a wealth of evidence that contradicts the current study. Sagsoz et al. (2021) reports lower HRQL for PD patients with high ADHD symptoms, further reports of worsened QoL scores for adults with ADHD (Agarwal et al., 2022; Oerbeck et al., 2015). Asztely et al. (2019) states that lower HRQL was found in chronic pain patients with ADHD, and Marki et al. (2017) includes the role of ERD within a study of women with chronic pain (endometriosis) and HRQL, again finding that increased ERD was related to lower HRQL for women with endometriosis. Therefore, it is difficult to explain the findings in this study. It could be considered that although the Burckhardt & Anderson (2003) QoL scale is a widely used scale with a robust validity and internal consistency, the wording of the scale may be considered confusing or outdated for a contemporary study. Alternatively, when measuring QoL in a study investigating chronic pain (MSS) it would be advised to use a health-related QoL scale such as the Short Form – 36 as utilised by Sagsoz et al. (2021) or the EQ-5D as used by Fernandez-Martinez et al. (2019) in a study of dysmenorrhea in Spanish students. Considering the previous literature, it was expected to find reduced QoL for participants with ADHD and high ERD, and a possible association with increased MSS but that cannot be stated from the current study.

#### 4.1 Strengths, Limitations and Future Directions

The extent of the current literature that identifies the impact of ADHD and ERD on MSS and QoL is very limited as it is a relatively new research area for women's health. The current study has identified a general population sample which is considered a strength of the study as previous research predominantly focuses on clinical populations (Kabukcu et al., 2021; Sagsoz et al., 2021). Another benefit of the current study design is the comparison

between a population of women with an ADHD diagnosis and without an ADHD diagnosis in the participant sample with a between-subjects design. To the best of the researcher's knowledge this has not been done in a general population sample, with the only other study of this type being conducted on an entirely ADHD population without a comparison group (Lockinger & Gagnon et al., 2023).

A limitation of the current study is that no demographic data was collected on underlying secondary dysmenorrhea conditions, or the use of a baseline pain assessment when not experiencing menstruation as both factors may have been informative. A difficulty of measuring MSS is that there is not a well-used or recognised assessment scale that can be utilised as an effective measure of menstrual symptoms. The development of a suitable scale would benefit future research in this area (Teheran et al., 2018). The participant sample was very heavily weighted towards no ADHD diagnosis participants due to difficulty recruiting participants with an ADHD diagnosis. Having said that, a general population of adults would expect to see 3-4% represented in an ADHD population according to NHS England (2024) and this was exceeded. Ideally in future studies researchers would be advised to consider utilising an ADHD symptom checker scale such as the ASRS or to pair match the participant sample.

Future studies could consider further investigation of ADHD and ERD on MSS and QoL, as there appears to be an associated trend between ADHD and MSS, and more evidence is needed in support of the current findings that high ERD influence MSS. Recruiting a larger general population participant sample would be of benefit for more robust results testing, and utilising different scales such as a health-related QoL scale for an effective measure of how MSS affects health-related QoL. Further consideration should be given to the screening of ADHD and dysmenorrhea in female populations and should hope to further inform women

and clinicians on the benefits of emotion regulation skill interventions (Haspert et al., 2020) for effective treatment and reduced MSS for women with or without ADHD.

#### 4.2 Conclusion

The current study investigated the presence of ADHD and ERD, and how they impact on MSS and QoL in a general population of female university students. The study highlights the role of emotion regulation in chronic pain, specifically for dysmenorrhea, and the importance of considering ERD in pain perception studies. While there was a slight trend shown for women with ADHD experiencing increased MSS, this was not significant, and there was no association found in QoL satisfaction which was surprising. It suggests a need for future research to further evaluate the complex relationships involved in ADHD, emotion regulation and pain perception, to make improvements to women's health.

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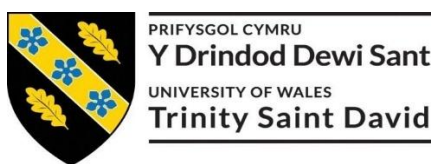
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## Appendix A



### Study Information Sheet

This page contains key information about the current study and provides details about what you will be asked to do. Therefore, please read this information sheet carefully before giving your consent to take part.

**If at any time you wish to end the study, you can do this by closing the browser window.**

This study is being conducted by a UWTSD undergraduate student for a level 6 dissertation research project. The purpose of the study is to measure menstrual symptoms and quality of life while considering the presence of Attention Deficit Hyperactive Disorder (ADHD) and emotion regulation difficulties.

During this study you will be asked to do the following;

1. Complete a demographics form which will ask your age and if you have been diagnosed with ADHD, the age you were at diagnosis, and if you currently take prescription medication for ADHD.
2. Complete a survey about emotion regulation difficulties, menstrual symptoms and how satisfied you are with your quality of life.

**The menstrual symptom survey will involve answering questions about your pain experiences as well as discomfort during urination and bowel movements during a period. If you feel you would not like to answer personal questions about your menstrual symptoms, you are advised not to take part in this study.**

This study will take approximately 20 minutes to complete

If you have any questions or wish to discuss the study further, please contact either the principle researcher or study supervisor at the contact details below;

#### Principal researcher

Claire Macare [1706076@student.uwtsd.ac.uk](mailto:1706076@student.uwtsd.ac.uk)

#### Study Supervisor

Dr Stuart Jones [S.A.Jones@uwtsd.ac.uk](mailto:S.A.Jones@uwtsd.ac.uk)

Once you have submitted your answers this will be the end of the study and you will be taken to the study debrief sheet. All data will be collected and stored anonymously, and only accessible to the researcher in accordance with the Data Protection Act (2018) and UWTSD Research Data Management Policy. Once you have submitted your survey answers you will no longer be able to withdraw from the study due to the anonymous data collection.

**If at any time you wish to stop the study before you have submitted your answers, you can exit the study by closing the browser window**

Please click the blue arrow to be taken to the consent form

**Appendix B**  
**Study Consent Form**

To give your consent to participate in this study, please read and agree to the following statements by clicking on each statement below, followed by the blue next arrow to begin the study.

I have read and understood the Study Information Sheet

I am aged 18 or over

I am female or was born female and have experienced a menstrual cycle within the last 12 months

I understand that I can end the study at any time by closing the browser window

I give my consent to participate in this study

Please press continue to begin the study

**Appendix C**  
**Demographic Information**

Please answer the following questions

Age

Do you have an ADHD diagnosis?

Yes ☐

No ☐

If yes to the previous question please answer the following,  
At what age were you diagnosed with ADHD?

Do you currently take prescription medication for ADHD?

Yes ☐

No ☐

## Appendix D

### Difficulties in Emotion Regulation Scale – 16 item version (DERS-16)

|              |           |                        |                  |               |
|--------------|-----------|------------------------|------------------|---------------|
| 1            | 2         | 3                      | 4                | 5             |
| Almost never | Sometimes | About half<br>the time | Most of the time | Almost always |
| 0-10%        | 11-35%    | 36-65%                 | 66-90%           | 91-100%       |

Please indicate how often the following statements apply to you by writing the appropriate number from the scale above (1 – 5) in the box alongside each item.

1. I have difficulty making sense out of my feelings. [CLARITY\*]
2. I am confused about how I feel. [CLARITY]
3. When I'm upset, I have difficulty getting work done. [GOALS]
4. When I'm upset, I become out of control. [IMPULSE]
5. When I'm upset, I believe that I will remain that way for a long time. [STRATEGIES]
6. When I'm upset, I believe that I'll end up feeling very depressed. [STRATEGIES]
7. When I'm upset, I have difficulty focusing on other things. [GOALS]
8. When I'm upset, I feel out of control. [IMPULSE]
9. When I'm upset, I feel ashamed with myself for feeling that way. [NONACCEPTANCE]
10. When I'm upset, I feel like I am weak. [NONACCEPTANCE]
11. When I'm upset, I have difficulty controlling my behaviors. [IMPULSE]
12. When I'm upset, I believe that there is nothing I can do to make myself feel better.  
[STRATEGIES]
13. When I'm upset, I become irritated with myself for feeling that way. [NONACCEPTANCE]
14. When I'm upset, I start to feel very bad about myself. [STRATEGIES]
15. When I'm upset, I have difficulty thinking about anything else. [GOALS]
16. When I'm upset, my emotions feel overwhelming. [STRATEGIES]

CLARITY = Lack of Emotional Clarity; GOALS = Difficulties Engaging in Goal-Directed Behavior; IMPULSE = Impulse Control Difficulties; STRATEGIES = Limited Access to Effective Emotion Regulation Strategies; NONACCEPTANCE = Nonacceptance of Emotional Responses.

\*Factor as described in the original study of the 36-item DERS ([Gratz & Roemer, 2004](#)). This information was not presented to participants.

(Bjurberg et al., 2016)

## Appendix E

### Menstrual Distress Questionnaire (MEDIQ)

**Instructions - Please carefully review the list of provided symptoms.**

Please answer for each symptom that you have experienced during your periods in the last 12 months. If you did not experience a particular symptom, please answer “No” and skip to the next symptom on the list. However, if you did experience a symptom, please also indicate the impact of that symptom on your functioning and quality of life.

On average, in the past year on the days you had your period, did you

1. Have pain in your lower abdomen?
2. Have muscle/bone/joint pain?
3. Feel bloated or experience breast tenderness?
4. Experience nausea?
5. Have headaches?
6. Have diarrhea?
7. Have constipation?
8. Have pain during urinating
9. Have pain during bowel movement
10. Feel excessively sad?
11. Feel irritable or short tempered?
12. Have insomnia (inability to fall or stay asleep)?
13. Experience excessive sleepiness?
14. Feel excessively tired?
15. Have difficulty concentrating?

|                                                             |                                                             |           |
|-------------------------------------------------------------|-------------------------------------------------------------|-----------|
| <b>Yes</b><br><small>More than half<br/>of the time</small> | <b>Yes</b><br><small>Less than half<br/>of the time</small> | <b>No</b> |
|-------------------------------------------------------------|-------------------------------------------------------------|-----------|

If you answer yes to the above question, please indicate to what degree it interfered with your quality of life, your recreational or work activities, or your relationships

|                       |                 |                   |             |
|-----------------------|-----------------|-------------------|-------------|
| <b>Not at<br/>all</b> | <b>A little</b> | <b>Moderately</b> | <b>Very</b> |
|-----------------------|-----------------|-------------------|-------------|

## Appendix F

### QUALITY OF LIFE SCALE (QOL)

Please read each item and circle the number that best describes how satisfied you are at this time. Please answer each item even if you do not currently participate in an activity or have a relationship.

You can be satisfied or dissatisfied with not doing the activity or having the relationship.  
 7= Delighted 6=Pleased 5=Mostly Satisfied 4=Mixed 3=Mostly Dissatisfied 2=Unhappy  
 1=Terrible

1. Material comforts home, food, conveniences, financial security . . . . . 7 6 5 4 3 2 1
2. Health - being physically fit and vigorous . . . 7 6 5 4 3 2 1
3. Relationships with parents, siblings & other relatives- communicating, visiting, helping . . . 7 6 5 4 3 2 1
4. Having and rearing children . . . . . 7 6 5 4 3 2 1
5. Close relationships with spouse or significant other . . . . . 7 6 5 4 3 2 1
6. Close friends . . . . . 7 6 5 4 3 2 1
7. Helping and encouraging others, volunteering, giving advice . . . . . 7 6 5 4 3 2 1
8. Participating in organizations and public affairs . . . . . 7 6 5 4 3 2 1
9. Learning- attending school, improving understanding, getting additional knowledge . . 7 6 5 4 3 2 1
10. Understanding yourself - knowing your assets and limitations - knowing what life is about . . 7 6 5 4 3 2 1
11. Work - job or in home . . . . . 7 6 5 4 3 2 1
12. Expressing yourself creatively . . . . . 7 6 5 4 3 2 1
13. Socializing - meeting other people, doing things, parties, etc . . . . . 7 6 5 4 3 2 1
14. Reading, listening to music, or observing entertainment . . . . . 7 6 5 4 3 2 1
15. Participating in active recreation . . . . . 7 6 5 4 3 2 1
16. Independence, doing for yourself . . . . . 7 6 5 4 3 2 1

(Burckhardt & Anderson, 2003)

## Appendix G

### Study Debrief Sheet

#### **Menstrual symptom severity and Quality of Life for adult women with Attention-Deficit-Hyperactive-Disorder**

Thank you for taking part in this study

Previous research indicates that there are links between emotion dysregulation, ADHD symptoms and pain sensitivity. The aim of this study was to assess levels of menstrual symptoms and quality of life and to identify whether women with an ADHD diagnosis and emotion regulation difficulties experience menstrual symptoms differently when compared to a control group, and the impact this may have on quality of life domains.

If you wish to discuss anything following your participation of this study please see the contact details below. If you have any concerns of a medical nature, health advice can be accessed on the NHS website, <https://www.nhsinform.scot/healthy-living/womens-health/girls-and-young-women-puberty-to-around-25/periods-and-menstrual-health/period-pain-dysmenorrhoea/> or please speak with your GP.

If taking part in this study has raised any questions please speak to the researcher [Claire Macare \(1706076@student.uwtsd.ac.uk\)](mailto:1706076@student.uwtsd.ac.uk) or contact the academic supervisor [Dr Stuart Jones \(s.a.jones@uwtsd.ac.uk\)](mailto:s.a.jones@uwtsd.ac.uk).

Further support can be found at UWTSD student services where information about student wellbeing and support is available at <https://www.uwtsd.ac.uk/experience-facilities/student-support-wellbeing>

**Thank you once again for taking time to participate in this study.**

## Appendix H



### ECPS6001: Psychology Empirical Project

#### Research Proposal

Assessment Component 1: Research proposal (1,000 words) worth 10% of the overall module mark for the Psychology Empirical Project. The proposal form will be marked in line with the Level Six Grading Rubric. The boxes below will expand as you type.

|                                        |                                                                                                                                                                |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Student Name and University ID number: | Claire Macare<br><br>1706076                                                                                                                                   |
| Proposed Supervisor's name:            | <i>Only complete this if you have already been in contact with a potential supervisor who has agreed to supervise you in principle.</i><br><br>Dr Stuart Jones |

#### Psychology Research Area (tick all that apply)

|                                                             |                          |                        |                         |
|-------------------------------------------------------------|--------------------------|------------------------|-------------------------|
| Social Psychology                                           | Developmental Psychology | Biological Psychology  | Forensic Psychology     |
| Health Psychology                                           | Individual Differences   | Educational Psychology | Political Psychology    |
| Cognitive Psychology                                        | Clinical Psychology      | Counselling Psychology | Occupational Psychology |
| <i>Other: indicate briefly (not included in word count)</i> |                          |                        |                         |

#### Proposed Study Design (tick all that apply)

|                                                                                                                                                                                 |                                      |                                                                          |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------|-----------------------------|
| Quantitative                                                                                                                                                                    | Experimental                         | Applied (with UWTSD students                                             | Online Questionnaire Survey |
| Qualitative                                                                                                                                                                     | Quasi Experimental                   | Focus Groups                                                             | Online                      |
| Mixed Methods                                                                                                                                                                   | Applied (with external organisation) | Interviews                                                               | Lab-based study             |
| <i>If Applied, and involving an external organisation, please indicate your plans for gaining appropriate approvals from the organisation: (not included in the word count)</i> |                                      | <i>Other study design: indicate briefly (not included in word count)</i> |                             |

**Suggested Research Title/Area:** (between 10-15 words and must reflect the essence of your proposed research question, study design and study population and should be more specific than a broad topic area).

The interaction of ADHD and emotion regulation difficulties in adult women, and its impact on menstrual symptom severity, and self-esteem: A quantitative study.

**Background: 250 words**

**Why is your study important? What theory and empirical research evidence supports your research question?** (Please provide a rationale for your study including a brief review of relevant psychological literature and theory and a minimum of five references).

This study would contribute data on Attention-deficit-hyperactive Disorder (ADHD) and menstrual symptom severity (MSS) to initial research in this area. It aims to understand the risk factors and impact for ADHD women, further informing clinicians to consider both ADHD and MSS when exploring treatments or interventions for ADHD and pain management.

Recent research suggests a link between ADHD and increased MSS during menstruation, termed dysmenorrhea (Kabakcu et al., 2021; Lockinger & Gagnon,

2023; Nagy et al., 2023). This significantly impacts on daily activities, resulting in a detrimental effect on the individuals physical and psychological health and self-esteem (Teheran et al., 2018). Furthermore, for women with ADHD, there are deficiencies in dopamine, attention, and emotion regulation and is commonly diagnosed later than adolescence, all of which can impact self-esteem (Kerekes et al., 2021). In addition, Bruton et al., (2023) indicates that emotion dysregulation in an ADHD population is associated with pain sensitivity. Emotion regulation (ER) skills have been found to modulate perceived pain, therefore the ability to regulate emotions is thought to affect the ability to regulate pain experiences (Haspert et al., 2020). Difficulties in emotion regulation are often described as a symptom of ADHD traits, which could explain the potential risk factor for women with ADHD during menstruation.

Levels of self-esteem, (an individuals sense of self-worth) can influence the use of emotion regulation strategies (Fernandes et al., 2022), therefore ER difficulties can be associated with low self-esteem.

Initial research has predominantly examined clinical populations of adolescents, or alongside other comorbid psychological disorders such as depression and anxiety, or chronic pain disorders (Gao et al., 2020). Gao et al., (2020) reported a higher prevalence of ADHD in endometriosis patients than the general population. More research is needed to further support the previous findings that increased MSS is experienced by women with ADHD (Lockinger & Gagnon, 2023). The current study will address the gap in the literature by identifying an adult sample of the general population both with and without an ADHD diagnosis.

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Teherán, A. A., Piñeros, L. G., Pulido, F., & Mejía Guatibonza, M. C. (2018). WaLIDD score, a new tool to diagnose dysmenorrhea and predict medical leave in university students. *International journal of women's health*, 35-45. <https://doi.org/10.2147/IJWH.S143510>

**Please state the main research question(s) or hypotheses(s): (100 words max)**

### Research questions:

Are there differences in menstrual symptom severity and self-esteem for adult women with, and without an ADHD diagnosis?

Will emotion regulation difficulties have an effect on menstrual symptom severity (dysmenorrhea) and self-esteem scores?

Is there an interaction between ADHD status and emotion regulation difficulties and do they have an influence on MSS and self-esteem levels in adult women?

It is hypothesised that women with ADHD will experience higher menstrual symptom severity and individuals with high levels of emotion regulation difficulties will experience higher menstrual symptom severity. Self-esteem levels will be negatively influenced by increased ADHD symptom severity, increased emotion regulation difficulty and increased MSS.

### **Methodological Details (500 words)**

***Please summarise the key methodological approach: (you can include copies of proposed study materials as appendices if you wish). You must include details of the following:***

- *Participants: Who will your participants be, how will you access and recruit them, and how many are needed?*
- *Design: Using appropriate terminology clearly define key elements of your design (IVs, DVs, Qual approach, expt. manipulations etc). How do you plan to analyse your main data?*
- *Materials: What are the main measures, scales, experimental tools or other materials required for your study?*
- *Procedure: How will you carry out the study – define briefly what will happen to a participant in your study from the point of consent to the study debrief.*

### **Participants:**

Participants over the age of 18 will be recruited via the UWTSD Experimental Management System (EMS) and the inclusion criteria will specify that the study is

for individuals assigned female at birth who still experience menstruation. The study will target two participant groups, women with an ADHD diagnosis and women without an ADHD diagnosis. To avoid low participant numbers the study will be made available to other participants meeting the inclusion criteria via the University social media pages and other social media groups. Full ethical considerations and procedures will be followed for the study to be open to external participants. Considerations for suitable sample size for the study suggest a minimum of 12 participants per group, therefore participant recruitment would need to be in excess of  $n=72$  (Cooligan, 2009).

### **Design:**

The study is a quantitative, between-subjects, factorial design. The experiment will consist of online self-report measures

### **Independent Variables**

ADHD status, participants will be categorised into 3 levels – no diagnosis, ADHD low symptoms, ADHD high symptoms

Emotion regulation difficulties, participants will be categorised into 2 levels – low, high

### **Dependent Variables**

Menstrual symptom severity

Self-esteem

Both DV's will be measured on a continuous scale from the mean scores.

Using SPSS, a multivariate analysis of variance (MANOVA) will be conducted to establish the effect sizes of each IV group (ADHD status x 3 levels and emotion regulation difficulties x 2 levels) on MSS and self-esteem scores, and to further measure any interaction effects.

### **Materials:**

Information sheet, Consent form, demographic information, and debrief form.

Difficulties in Emotion Regulation Scale – 16 item version (DERS-16), (Bjurberg et al., 2016) asks for a response to 16 items using a 5-point likert scale, the score will be used to categorise participants into 2 groups (Low emotion regulation difficulties, and high emotion regulation difficulties).

The WMH-CIDI Adult ADHD self-report scale (ASRS) (Kessler et al., 2005) – an 18 item scale used to measure ADHD symptom severity used to categorise participants with ADHD into 2 groups – low symptom severity and high symptom severity.

Rosenberg Self-esteem scale (Rosenberg, 1965) – a 10 item scale with a 4-point likert scale to assess participants self-esteem scores.

Menstrual Distress Questionnaire (MEDI-Q) (Vannuccini et al., 2021) – a 25 item scale giving an overall total score. For the purpose of this study which is focusing on the physical symptoms of menstruation and its impact on daily activities, the scale will be reduced to become 14 item scale. (Items 11-19, 23 and 25 will be omitted)

#### **Procedure:**

Participants will sign up online and will be guided to an information sheet and consent form. Participant demographic information will also include . Only those that indicate they have an ADHD diagnosis will be asked to complete the ASRS for ADHD status categorisation. Next the DERS-16 will be completed, followed by the adapted MEDI-Q questionnaire, and the Self-esteem questionnaire. The study will conclude and the debrief sheet will be displayed.

#### **Key Ethical considerations (150 words)**

*In this section you are required to briefly outline any specific ethical considerations for your project. All projects will be expected to adhere to the BPS code of human research ethics, and you will need to submit a full ethics form which will document your specific processes for informed consent, debriefing, and data protection. Here you need to briefly note additional or specific key ethical considerations for your particular project e.g. potential for distress or discomfort, any deception, research with vulnerable populations or sensitive topic areas, and briefly outline how you expect to manage these risks within your project.*

The BPS code of human research ethics (Oates et al., 2021) will be followed and participants will be made aware of the topics involved in the study. Specifically,

questions about menstrual symptom severity during menstruation and indicating the presence of ADHD and related symptoms. This information will be made available via the recruitment process and information sheet so that informed consent may be given.

The opportunity to withdraw from the study before and at any time during the study will be given, however due to the anonymous data collection and storage of the EMS, the participant will be informed they are unable to withdraw their data from the study after final submission. This is to ensure the protection of the individuals privacy and anonymity so that they cannot be identified by the studies findings. In line with the *Data Protection Act (2018)* all data will be stored securely and anonymously.

Some of the questionnaires may cause distress, particularly the ADHD symptom severity scale (although freely available to the public), after ethical consideration, only individuals that indicate an ADHD diagnosis will be asked to complete the ASRS to avoid any potential harm to the participant. Further ethical consideration has been given to the reporting of menstrual symptom severity using the MEDI-Q, some items have been omitted to reduce and simplify the length of the questionnaire, and to remove questions regarding sexual intercourse that may be considered intrusive and to minimise any potential harm or upset to the participant. Following the study a full debrief will be provided including the contact details of the researcher and supervisor should any questions arise that the participant may wish to discuss.

### Reference List

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<https://doi.org/10.1016/j.rbmo.2021.08.029>

## Appendix I

### APPLICATION FOR ETHICAL APPROVAL

#### RESEARCH STUDENTS

This form is to be completed by the student within **SIX** months for full-time students and **TWELVE** months for part time students, after the commencement of the research degree or following progression to Part Two of your course.

Once complete, submit this form via the **MyTSD Doctoral College Portal** at (<https://mytsd.uwtsd.ac.uk>).

This document is also available in Welsh.

#### RESEARCH STAFF ONLY

All communications relating to this application during its processing must be in writing and emailed to [pgresearch@uwtsd.ac.uk](mailto:pgresearch@uwtsd.ac.uk) , with the title 'Ethical Approval' followed by your name.

**STUDENTS ON UNDERGRADUATE OR TAUGHT MASTERS PROGRAMMES** should submit this form (and receive the outcome) via systems explained to you by the supervisor/module leader.

**In order for research to result in benefit and minimise risk of harm, it must be conducted ethically. A researcher may not be covered by the University's insurance if ethical approval has not been obtained prior to commencement.**

The University follows the OECD Frascati manual definition of **research activity**: "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications". As such this covers activities undertaken by members of staff, postgraduate research students, and both taught postgraduate and undergraduate students working on dissertations/projects.

The individual undertaking the research activity is known as the "principal researcher".

Ethical approval is not required for routine audits, performance reviews, quality assurance studies, testing within normal educational requirements, and literary or artistic criticism.

**Please read the notes for guidance before completing ALL sections of the form.**

**This form must be completed and approved prior to undertaking any research activity.**  
Please see Checklist for details of process for different categories of application.

#### **SECTION A: About You (Principal Researcher)**

|   |                            |                                     |                             |                           |                               |
|---|----------------------------|-------------------------------------|-----------------------------|---------------------------|-------------------------------|
| 1 | Full Name:                 | Claire Macaré                       |                             |                           |                               |
| 2 | Tick all boxes that apply: | Member of staff:                    | <input type="checkbox"/>    | Honorary research fellow: | <input type="checkbox"/>      |
|   | Undergraduate Student      | <input checked="" type="checkbox"/> | Taught Postgraduate Student | <input type="checkbox"/>  | Postgraduate Research Student |

|                      |                                       |                                                                              |
|----------------------|---------------------------------------|------------------------------------------------------------------------------|
| 3                    | Institute/Academic Discipline/Centre: | Yr Athrofa – Psychology and Counselling                                      |
| 4                    | Campus:                               | Carmarthen                                                                   |
| 5                    | E-mail address:                       | <a href="mailto:1706076@student.uwtsd.ac.uk">1706076@student.uwtsd.ac.uk</a> |
| 6                    | Contact Telephone Number:             | 07528619848                                                                  |
| <b>For students:</b> |                                       |                                                                              |
| 7                    | Student Number:                       | 1706076                                                                      |
| 8                    | Programme of Study:                   | BSc Applied Psychology                                                       |
| 9                    | Director of Studies/Supervisor:       | Dr Stuart Jones                                                              |

### SECTION B: Approval for Research Activity

|                                                     |                                                                                                                                                                                                              |                                     |                                     |    |                          |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|----|--------------------------|
| 1                                                   | Has the research activity received approval in principle?<br>(please check the Guidance Notes as to the appropriate approval process for different levels of research by different categories of individual) | YES                                 | <input checked="" type="checkbox"/> | NO | <input type="checkbox"/> |
|                                                     |                                                                                                                                                                                                              |                                     |                                     |    | <b>Date</b>              |
| 2                                                   | If Yes, please indicate source of approval (and date where known):<br><b>Approval in principle must be obtained from the relevant source prior to seeking ethical approval</b>                               | Research Degrees Committee          | <input type="checkbox"/>            |    |                          |
| Institute Research Committee                        |                                                                                                                                                                                                              | <input type="checkbox"/>            |                                     |    |                          |
| Other (write in) Dr Stuart Jones (study supervisor) |                                                                                                                                                                                                              | <input checked="" type="checkbox"/> | 13/08/24                            |    |                          |

### SECTION C: Internal and External Ethical Guidance Materials

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                     |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
|   | Please list the core ethical guidance documents that have been referred to during the completion of this form (including any discipline-specific codes of research ethics, location-specific codes of research ethics, and also any specific ethical guidance relating to the proposed methodology). Please tick to confirm that your research proposal adheres to these codes and guidelines. You may add rows to this table if needed. |                                     |
| 1 | <b><u>UWTSD Research Ethics &amp; Integrity Code of Practice</u></b>                                                                                                                                                                                                                                                                                                                                                                     | <input checked="" type="checkbox"/> |
| 2 | <b>UWTSD Research Data Management Policy</b>                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |
| 3 | <b>BPS Code of Human Research Ethics (April 2021)</b>                                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> |
| 4 | <b>BPS Ethics Guidelines for Internet-mediated Research (June 2021)</b>                                                                                                                                                                                                                                                                                                                                                                  | <input checked="" type="checkbox"/> |
| 5 | <b>BPS Data Protection Regulation – Guidance for Researchers (2018)</b>                                                                                                                                                                                                                                                                                                                                                                  | <input checked="" type="checkbox"/> |
| 6 | <b>BPS Code of Ethics and Conduct (2021)</b>                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |

### SECTION D: External Collaborative Research Activity

If there are external collaborators then you should gain consent from the contact persons to share their personal data with the university. If there are no external collaborators then leave this section blank and continue to section E.

|   |                                                                                                             |                                                                                                                                  |
|---|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1 | Institution                                                                                                 |                                                                                                                                  |
| 2 | Contact person name                                                                                         |                                                                                                                                  |
| 3 | Contact person e-mail address                                                                               |                                                                                                                                  |
| 4 | Is your research externally funded?                                                                         | YES <input type="checkbox"/> NO <input type="checkbox"/>                                                                         |
| 5 | Are you in receipt of a KESS scholarship?                                                                   | YES <input type="checkbox"/> NO <input type="checkbox"/>                                                                         |
| 6 | Are you specifically employed to undertake this research in either a paid or voluntary capacity?            | Voluntary YES <input type="checkbox"/> NO <input type="checkbox"/>                                                               |
| 7 |                                                                                                             | Employed YES <input type="checkbox"/> NO <input type="checkbox"/>                                                                |
| 8 | Is the research being undertaken within an existing UWTSD Athrofa Professional Learning Partnership (APLP)? | If YES then the permission question below does not need to be answered. YES <input type="checkbox"/> NO <input type="checkbox"/> |
| 9 | Has permission to undertake the research has been provided by the partner organisation?                     | (If YES attach copy) If NO the application cannot continue. YES <input type="checkbox"/> NO <input type="checkbox"/>             |

### Where research activity is carried out in collaboration with an external organisation

|    |                                                                                                                                                 |                                                          |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| 10 | Does this organisation have its own ethics approval system?                                                                                     | YES <input type="checkbox"/> NO <input type="checkbox"/> |
|    | If Yes, please attach a copy of any final approval (or interim approval) from the organisation (this may be a copy of an email if appropriate). |                                                          |

### SECTION E: Details of Research Activity

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                   |                    |          |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| 1 | Indicative title:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Menstrual Symptom Severity and Quality of Life for Adult Women with Attention-Deficit-Hyperactive-Disorder (ADHD) |                    |          |
| 2 | Proposed start date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 01/12/24                                                                                                          | Proposed end date: | 21/05/25 |
|   | <p><b>Introduction to the Research (maximum 300 words per section)</b></p> <p><b>Ensure that you write for a <u>Non-Specialist Audience</u> when outlining your response to the points below:</b></p> <ul style="list-style-type: none"> <li>• <i>Purpose of Research Activity</i></li> <li>• <i>Proposed Research Question</i></li> <li>• <i>Aims of Research Activity</i></li> <li>• <i>Objectives of Research Activity</i></li> </ul> <p>Demonstrate, briefly, how <b><u>Existing Research</u></b> has informed the proposed activity and explain</p> <ul style="list-style-type: none"> <li>• <i>What the research activity will add to the body of knowledge</i></li> <li>• <i>How it addresses an area of importance.</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                   |                    |          |
| 3 | <p><b>Purpose of Research Activity</b></p> <p>To measure menstrual symptom severity (MSS) and Quality of Life in an adult population of women to identify if the presence of Attention-deficit-hyperactive Disorder (ADHD), and emotion dysregulation influence an individual's experience of dysmenorrhea and how impactful this may be in the different life domains that affect an individual's quality of life. It seeks to investigate if emotion regulation has a moderating effect on ADHD, MSS and Quality of Life (QoL).</p> <p>There is significant evidence stating that individuals with ADHD have hypersensitivity to pain (Treister et al., 2015), however, little is known regarding the topic of menstrual pain (dysmenorrhea) severity and ADHD. Recent research suggests a link between ADHD and increased MSS during menstruation (Kabkcu et al., 2021; Nagy et al., 2023), initial studies have predominantly examined clinical populations of adolescents, or alongside other comorbid psychological disorders such as depression and anxiety, or chronic pain disorders (Gao et al., 2020). Gao et al., (2020) reported a higher prevalence of ADHD in endometriosis patients (secondary dysmenorrhea) than the general population and in a study by Lockinger and Gagnon, (2023) they identified an increased risk of MSS for adolescents with ADHD. More research is needed to further explore if increased MSS is experienced beyond adolescence, by adult women with ADHD (Lockinger &amp; Gagnon, 2023).</p> <p>ADHD, characterised by inattention, impulsivity, and difficulties in emotion regulation, is commonly mis-diagnosed or diagnosed after adolescence for girls, having a detrimental effect on an individual's wellbeing (Kerekes et al., 2021; Teheran et al., 2018) due to its impact on daily activities. Severe menstrual symptoms are also known to largely impact daily activities through inability to concentrate, absence at school or work, and missing social events, sporting or leisure activities, and adding further burden and decline to an individual's quality of life, (Cook &amp; Hoek et al., 2023; Schoep et al., 2019) particularly if this is experienced regularly. According to Bruton et al., (2023) emotion dysregulation in an ADHD population is associated with pain sensitivity, and Haspert et al. (2020) considers emotion regulation skills to have a moderating effect on pain perception. Difficulties in emotion regulation are often described as a symptom of ADHD traits, which could explain the potential risk factor for women with ADHD during menstruation.</p> |                                                                                                                   |                    |          |

This study will address the gap in the literature by identifying an adult female sample of university students, both with and without an ADHD diagnosis. It intends to raise awareness of potential pain sensitivity during the menstrual cycle and its impact on quality of life and to inform clinicians of the potential risk factors for women with ADHD when considering effective pain management strategies during menstruation to alleviate and reduce the impact of loss of productivity and absenteeism at school and the workplace (Ponzo et al., 2022; Schoep et al., 2019) and potential ways to improve or prevent decline in quality of life for individuals severely affected by dysmenorrhea (Ju et al., 2014; Cook & van den Hoek, 2023).

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|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p>university students. <i>International journal of women's health</i>, 35-45.<br/> <a href="https://doi.org/10.2147/IJWH.S143510">https://doi.org/10.2147/IJWH.S143510</a></p> <p>Treister, R., Eisenberg, E., Demeter, N., &amp; Pud, D. (2015). Alterations in pain response are partially reversed by methylphenidate (Ritalin) in adults with attention deficit hyperactivity disorder (ADHD). <i>Pain Practice</i>, 15(1), 4-11.<br/> <a href="https://doi.org/10.1111/papr.12129">https://doi.org/10.1111/papr.12129</a></p> <p>Wang, L., Yan, Y., Qiu, H., Xu, D., Zhu, J., Liu, J., &amp; Li, H. (2022). Prevalence and risk factors of primary dysmenorrhea in students: a meta-analysis. <i>Value in Health</i>, 25(10), 1678-1684. <a href="https://doi.org/10.1016/j.jval.2022.03.023">https://doi.org/10.1016/j.jval.2022.03.023</a></p> <p>(this box should expand as you type)</p>                                       |
| 4 | <p><b>Research Question</b></p> <ol style="list-style-type: none"> <li>1. Are there differences in menstrual symptom severity and quality of life for adult women with, and without an ADHD diagnosis?</li> <li>2. Will emotion regulation difficulties have an effect on menstrual symptom severity (dysmenorrhea) and quality of life scores?</li> <li>3. Is there an interaction between ADHD status and emotion regulation difficulties and do they have an influence on MSS and quality of life levels in adult women?</li> </ol> <p>It is hypothesised that individuals with ADHD will experience increased menstrual symptom severity but that emotion regulation will act as a moderator.</p> <p>It is expected that quality of life scores will be negatively impacted by presence of ADHD, increased emotion regulation difficulties and increased menstrual symptom severity.</p> <p>(this box should expand as you type)</p> |
| 5 | <p><b>Aims of Research Activity</b></p> <p>The aim of the research is to address a gap in the previous literature by identifying a student population of adult women still experiencing a menstrual cycle and to gather further data to support initial findings that individuals with ADHD and emotion regulation difficulties experience increased dysmenorrhea symptoms and how this may impact on quality of life.</p> <p>It aims to highlight the risk factors of emotion regulation difficulties and severity of menstrual pain for ADHD women by identifying the negative influence on QoL domains, such as absence from work or school which can lead to decreased career success, a decline in interpersonal relationships creating a loss of social connection and community, and reduced health due to dysmenorrhea (Schoep et al., 2019).</p>                                                                                |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p>The study aims to raise awareness of potential risks to individuals and further informing clinicians and medical practitioners to consider the individual holistically to mitigate the potential risk for hypersensitivity to menstrual pain or increased risk of menstrual symptoms for women with ADHD (Lockinger &amp; Gagnon., 2023). Further supporting them to explore pain management strategies to increase QoL for dysmenorrhea sufferers and exploring how emotion regulation development interventions may also improve both pain sensitivity and ADHD symptoms for individuals (Haspert et al., 2020).</p> <p>(this box should expand as you type)</p>                       |
| 6 | <p><b>Objectives of Research Activity</b></p> <p>To gather quantitative data from participants via the EMS using online questionnaire surveys that are publicly available.</p> <p>To record ADHD status.</p> <p>Measure emotion regulation difficulties, menstrual symptom severity and quality of life scores of participants.</p> <p>Analyse the data using SPSS to identify possible links between ADHD presence and menstrual symptom severity. Investigate if emotion regulation is a moderator between ADHD, MSS and quality of life.</p> <p>Identify if ADHD presence, emotion regulation and MSS can impact quality of life scores.</p> <p>(this box should expand as you type)</p> |
|   | <p><b>Proposed methods (maximum 600 words)</b></p> <p>Provide a brief summary of all the methods that <b>may</b> be used in the research activity, making it clear what specific techniques may be used. If methods other than those listed in this section are deemed appropriate later, additional ethical approval for those methods will be needed. You do not need to justify the methods here, but should instead describe how you intend to collect the data necessary for you to complete your project.</p>                                                                                                                                                                         |
| 7 | <p><b><u>Design</u></b></p> <p>To understand possible links between ADHD, Emotion regulation, MSS and QoL this study will be a quantitative, between-subjects, factorial design. The experiment will consist of online self-report measures in the form of survey questionnaires that are all publicly available. Eligible participants can volunteer to take part, psychology students at UWTSD will be offered study credits for their participation, and the study will be completed online using survey questionnaires for self-report measures. Participants will not meet face to face with the researcher and will remain</p>                                                        |

anonymous by a unique ID code after data collection via Qualtrics. The study will target two participant groups, females with an ADHD diagnosis and females without an ADHD diagnosis as a control group.

### **Independent Variables**

ADHD status, participants will be categorised into 2 levels – no ADHD diagnosis, ADHD diagnosis

Emotion regulation difficulties, participants will be categorised into 2 levels – low, high

Creating 4 categorical groups

### **Dependent Variables**

Menstrual symptom severity

Quality of Life

Both DV's will be measured on a continuous scale from the mean scores and establishing a high score and a low score.

### **Materials:**

A draft of the survey questionnaire is available in the appendices in the order intended for the study. First participants will be directed to the demographic information (**Appendix A**). Demographic information collected will include age, gender, ADHD status, age of ADHD diagnosis and if medication is being taken to treat ADHD - as this has been known to affect pain sensitivity (Bruton et al., 2023; Treister et al., 2015).

Next participants will be directed to complete three self-report measures in a survey format.

- Difficulties in Emotion Regulation Scale – 16 item version (DERS-16), (Bjurberg et al., 2016) asks for a response to 16 items using a 5-point likert scale, the score will be used to categorise participants into 2 groups (Low emotion regulation difficulties, and high emotion regulation difficulties). **See Appendix B.**  
Emotion Regulation difficulty is considered by Hirsch et al., (2018) to be a core component of ADHD and that emotion dysregulation has a detrimental effect on life

domains. There is much research that suggests emotion regulation is associated with pain sensitivity (Bruton et al., 2023; Haspert et al., 2020).

- **Menstrual Symptom Severity (See Appendix C)**

There is no clear and available scale to assess dysmenorrhea and there are many variations globally due to variable definitions of symptoms, their severity, impact on women and attitudes towards dysmenorrhea (Ju et al., 2014; Wang et al., 2022). Therefore, to measure frequency and severity of symptoms a combined scale will consist of the PIPPA (a 5 item scale used to screen dysmenorrhea) and a reduced section of the Menstrual Distress Questionnaire (MEDI-Q) (Vannuccini et al., 2021), 15 items (out of 25) to report physical symptoms experienced during menstruation and its impact on daily activities.

The items that have been removed are irrelevant to the study and may cause distress to the participant. The items remaining are key symptoms of dysmenorrhea and necessary to measure, such as painful urination and bowel movements (McKenna & Fogleman, 2021).

- **Quality of Life Scale. (See Appendix D) – 16 item scale** (Burckhardt & Anderson, 2003) to measure satisfaction levels in quality of life domains using a 7 point likert scale. A general QoL scale that has been used in health psychology research was chosen as it reflected more accurately the nature of the current study compared to other more health-related scales.

There is much research that indicates emotion dysregulation, and ADHD symptom prevalence negatively impact quality of life domains (Hapert et al., 2020; Shaw et al., 2014). Research into dysmenorrhea experiences suggests that dysmenorrhea has a detrimental effect on quality of life (Schoep et al., 2019; Cook & Hoek, 2023) which suggests that it would be relevant to measure in the current study

The measures have been selected for this study because they are publicly available for use, widely used in research and with good to strong internal validity. Where possible, shortened versions have been chosen to reduce survey questions and participation time to minimise participant fatigue. Examples of the information sheet, consent form and demographic information questions and debrief sheet can be seen in the appendices (**See Appendix F,G,H**).

### **Procedure**

Participants will be recruited via the University of Wales, Trinity Saint David (UWTSD) Psychology Department Experiment Management System (EMS). and the inclusion criteria will specify that the study is for females and individuals assigned female at birth, 18 and over, who still experience a menstrual cycle.

Participants will be directed to the electronic study information sheet and asked to give their informed consent before continuing. Once consent is given Participants will be directed to the electronic demographic form followed by the 3 self-report measures presented in a survey/questionnaire format.

After completing all measures participants will be reminded that after final submission of their answers, they will no longer be able to withdraw from the study and asked if they consent to include their data in the study by clicking submit. They will then be directed to the electronic debrief form which contains a summary of the aims of the study, and contact information for the researcher and study supervisor as well as signposting to student support services and signposting to NHS health services..

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p><b><u>Analysis</u></b></p> <p>Using SPSS, a two-way multivariate analysis of variance (MANOVA) will be conducted to establish the main effect and any interaction of the IV groups (ADHD status x 2 levels and emotion regulation difficulties x 2 levels) on MSS and QoL scores, and to further investigate any interaction effects between MSS and QoL scores.</p> <p>Please see the appendix for examples of the information sheet (<b>Appendix E</b>), consent form (<b>Appendix F</b>), and debrief form (<b>Appendix G</b>).</p> <p>(this box should expand as you type)</p>                                                                                                                                                                                                                                             |
|   | <p><b>Location of research activity</b></p> <p>Identify all locations where research activity will take place.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 8 | <p>All research will be completed electronically online using Qualtrics.</p> <p>(this box should expand as you type)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|   | <p><b>Research activity outside of the UK</b></p> <p>If research activity will take place overseas, you are responsible for ensuring that local ethical considerations are complied with and that the relevant permissions are sought. Specify any local guidelines (e.g. from local professional associations/learned societies/universities) that exist and whether these involve any ethical stipulations beyond those usual in the UK (provide details of any licenses or permissions required). Also specify whether there are any specific ethical issues raised by the local context in which the research activity is taking place, for example, particular cultural and/or legal sensitivities or vulnerabilities of participants. If you live in the country where you will do the research then please state this.</p> |
| 9 | <p>N/A</p> <p>(this box should expand as you type)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|    |                                                                                                        |     |                                     |
|----|--------------------------------------------------------------------------------------------------------|-----|-------------------------------------|
| 10 | Use of documentation not in the public domain: Are any documents <b><u>NOT</u></b> publicly available? | NO  | <input checked="" type="checkbox"/> |
|    |                                                                                                        | YES | <input type="checkbox"/>            |

|    |                                                                                                                                                                                                                                                                                                                    |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 | <p>If Yes, please provide details here of how you will gain access to specific documentation that is not in the public domain and that this is in accordance with the current data protection law of the country in question and that of England and Wales.</p> <p><i>(this box should expand as you type)</i></p> |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    | <b>Does your research relate to one or more of the seven aims of the Well-being of Future Generations (Wales) Act 2015?</b>                                                                                                                                                                                              | <b>YES</b>                          | <b>NO</b>                           |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 12 | A prosperous Wales                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 | A resilient Wales                                                                                                                                                                                                                                                                                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 14 | A healthier Wales                                                                                                                                                                                                                                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 15 | A more equal Wales                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 16 | A Wales of cohesive communities                                                                                                                                                                                                                                                                                          | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 17 | A Wales of vibrant culture and thriving Welsh language                                                                                                                                                                                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 18 | A globally responsible Wales                                                                                                                                                                                                                                                                                             | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 19 | If YES to any of the above, please give details:                                                                                                                                                                                                                                                                         |                                     |                                     |
|    | <p>This study relates to the healthier Wales aim by exploring the menstrual health symptoms, emotion regulation difficulties and self-esteem levels in a population of adult women in Wales to identify and understand possible risk factors for women with ADHD.</p> <p><i>(this box should expand as you type)</i></p> |                                     |                                     |

## SECTION F: Scope of Research Activity

|    | <b>Will the research activity include:</b>                                                                                                      | <b>YES</b>                          | <b>NO</b>                           |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 1  | Use of a questionnaire or similar research instrument?                                                                                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2  | Use of interviews?                                                                                                                              | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 3  | Use of focus groups?                                                                                                                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 4  | Use of participant diaries?                                                                                                                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5  | Use of video or audio recording?                                                                                                                | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 6  | Use of computer-generated log files?                                                                                                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 7  | Participant observation with their knowledge?                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8  | Participant observation without their knowledge?                                                                                                | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9  | Access to personal or confidential information without the participants' specific consent?                                                      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 | Administration of any questions, test stimuli, presentation that may be experienced as physically, mentally or emotionally harmful / offensive? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 | Performance of any acts which may cause embarrassment or affect self-esteem?                                                                    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

|    |                                                                                                     |                          |                                     |
|----|-----------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|
| 12 | Investigation of participants involved in illegal activities?                                       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 | Use of procedures that involve deception?                                                           | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14 | Administration of any substance, agent or placebo?                                                  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15 | Working with live vertebrate animals?                                                               | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16 | Procedures that may have a negative impact on the environment?                                      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17 | Other primary data collection methods. Please indicate the type of data collection method(s) below. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|    | Details of any other primary data collection method:<br><br>(this box should expand as you type)    |                          |                                     |

If NO to every question, then the research activity is (ethically) low risk and **may** be exempt from **some** of the following sections (please refer to Guidance Notes).

If YES to any question, then no research activity should be undertaken until full ethical approval has been obtained.

## SECTION G: Intended Participants

If there are no participants then do not complete this section, but go directly to section H.

|   | Who are the intended participants:                                                                                 | YES                                 | NO                                  |
|---|--------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 1 | Students or staff at the University?                                                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2 | Adults (over the age of 18 and competent to give consent)?                                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3 | Vulnerable adults?                                                                                                 | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 4 | Children and Young People under the age of 18? (Consent from Parent, Carer or Guardian will be required)           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5 | Prisoners?                                                                                                         | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 6 | Young offenders?                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 7 | Those who could be considered to have a particularly dependent relationship with the investigator or a gatekeeper? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8 | People engaged in illegal activities?                                                                              | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9 | Others. Please indicate the participants below, and specifically any group who may be unable to give consent.      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|   | Details of any other participant groups:<br><br>(this box should expand as you type)                               |                                     |                                     |

| <b>Participant numbers and source</b><br>Provide an estimate of the expected number of participants. How will you identify participants and how will they be recruited? |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10                                                                                                                                                                      | How many participants are expected?     | <p>Using the Pillai's Trace test to calculate the sample size necessary for a two-way MANOVA with 4 IV groups and 2 DV's a sample size of <math>n=38</math> is necessary to achieve 80% power for detecting a medium effect, and a significance of <math>\alpha=.05</math></p> <p>Even distribution of participants is preferable and 38 is not divisible by 4 so the next nearest sample size to meet the minimum sample size criteria would be <math>n=40</math></p> <p>To mitigate for non-significance due to small sample size and considering the small target population of female UWTSD Psychology and Counselling department students the study will aim to recruit between <math>n=40-60</math> with a minimum of 10 -15 participants per IV group (Kang &amp; Jin 2016).</p> <p><i>(this box should expand as you type)</i></p> |
| 11                                                                                                                                                                      | Who will the participants be?           | <p>Participants targeted for recruitment will be students of University of Wales, Trinity Saint David from the psychology and counselling department. The participants will be female adults and adults assigned female at birth aged 18 and over, who are still experiencing a menstrual cycle.</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 12                                                                                                                                                                      | How will you identify the participants? | <p>Participants will be recruited via the University Experiment Management System (EMS) and will sign up online using their EMS ID. Each participant dataset will then be given a unique participant ID code to anonymise the data.</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| <b>Information for participants:</b> |                                                                                                                                                     | <b>YES</b>                          | <b>NO</b>                           | <b>N/A</b>                          |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 13                                   | Will you describe the main research procedures to participants in advance, so that they are informed about what to expect?                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 14                                   | Will you tell participants that their participation is voluntary?                                                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 15                                   | Will you obtain written consent for participation?                                                                                                  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 16                                   | Will you explain to participants that refusal to participate in the research will not affect their treatment or education (if relevant)?            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 17                                   | If the research is observational, will you ask participants for their consent to being observed?                                                    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 18                                   | Will you tell participants that they may withdraw from the research at any time and for any reason?                                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 19                                   | With questionnaires, will you give participants the option of omitting questions they do not want to answer?                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 20                                   | Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs? | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |

|    |                                                                                                                                                                                                                                                                                                                                                                           |                                     |                          |                          |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 21 | Will you debrief participants at the end of their participation, in a way appropriate to the type of research undertaken?                                                                                                                                                                                                                                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22 | If NO to any of above questions, please give an explanation                                                                                                                                                                                                                                                                                                               |                                     |                          |                          |
|    | <p>Questionnaires will be completed electronically online and consent will be gained by asking participants to tick a box and press continue to give their consent to participate in the study. Then after the questionnaires are completed by pressing a submit button to give their consent to collect the data.</p> <p><i>(this box should expand as you type)</i></p> |                                     |                          |                          |

|    | Information for participants:                                                                                                                      | YES                      | NO                                  | N/A                      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|
| 24 | Will participants be paid?                                                                                                                         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 25 | Is specialist electrical or other equipment to be used with participants?                                                                          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 26 | Are there any financial or other interests to the investigator or University arising from this study?                                              | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 27 | Will the research activity involve deliberately misleading participants in any way, or the partial or full concealment of the specific study aims? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 28 | If YES to any question, please provide full details                                                                                                |                          |                                     |                          |
|    | <i>(this box should expand as you type)</i>                                                                                                        |                          |                                     |                          |

## SECTION H: Anticipated Risks

|  |                                                                                                                                                                                  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Outline any anticipated risks that may adversely affect any of the participants, the researchers and/or the University, and the steps that will be taken to address them.</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• The nature of some questions have the potential for the participant to consider them as negative resulting in the participant feeling shame. For example, question 10 and 11 of the MSS that ask about mood symptoms such as sadness and irritability.</li> <li>• The MSS scale contains items of a personal nature that the participant may find intrusive such as item 6-9 about bowel movements and urination that may cause embarrassment, or to question their inclusion, however these are key symptoms of dysmenorrhea and therefore necessary to be included in the study (McKenna &amp; Fogleman, 2021).</li> </ul> <p>3. Risk to the participant for potential to evoke emotion and distress by completing the self-report measures including the Difficulty in Emotion regulation that ask about the participants feelings and to consider when they are upset.</p> <p>4. Participants may be concerned that they could be identified from the data they provide or that their data may not be stored or used correctly for the purpose of the study.</p> <p>5. A group of the target population have the potential to be identified as a vulnerable group</p> | <p>get in touch if they want to discuss any issues that have arisen for them.</p> <p>Scale items have been carefully considered and any that have been deemed as irrelevant or too intrusive or distressing have been removed to reduce the risk of harm to the participant. Participants have been advised to contact their GP if they have any concerns of a medical nature.</p> <p>3. Participants will be given information on the content of the study in the information sheet prior to the start of the study, informed they can end the study at any time by closing the browser window. Researcher and study supervisor contact information will be given to the participant should they wish to discuss any issues that have arisen while participating.</p> <p>4. The researcher will explain how data will be collected and handled confidentially and anonymised using Qualtrics. Some information about electronic data storage will be explained to the participant such as how long it will be stored and in a password protected file. Further detailed information about the data storage policies can be provided to the participant if required.</p> <p>5. The study has aimed to remove and reduce the items to limit the time that the study takes and to reduce risk of harm to participant from inappropriate or insensitive questions. Participants will be reminded multiple times throughout the study of their right to withdraw. Both researcher and supervisor contact details have been made available to the participant should they wish to discuss anything that has arisen for them through study participation. In addition, contact details for student services has</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                     |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p>due to the study requiring students with an ADHD diagnosis to take part.</p> <p>(this box should expand as you type)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>been provided should they wish to discuss something of a personal nature with a professional advisor/counsellor.</p> <p>(this box should expand as you type)</p> |
| 3 | <p>If research activity may include sensitive, embarrassing or upsetting topics (e.g. sexual activity, drug use) or issues likely to disclose information requiring further action (e.g. criminal activity), give details of the procedures to deal with these issues, including any support/advice (e.g. helpline numbers) to be offered to participants. Note that where applicable, consent procedures should make it clear that if something potentially or actually illegal is discovered in the course of a project, it may need to be disclosed to the proper authorities</p> |                                                                                                                                                                     |
|   | <p>Sensitive health information is involved in the study, participants will be given all of the information needed to give informed consent to participate in the study. Any medical and health queries will be directed to the NHS website for information, advice and support. Advise to address any health concerns by contacting your GP.</p> <p>(this box should expand as you type)</p>                                                                                                                                                                                        |                                                                                                                                                                     |
| 4 | <p><b>Risks to the investigator</b></p> <p>For example: personal health &amp; safety, physical harm, emotional distress, risk of accusation of harm/impropriety, conflict of interest</p>                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                     |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p>Risk to the investigator:</p> <p>1. As the researcher's email is provided to the participants there is the potential that the researcher may receive negative emails and unwelcome communication from participants.</p> <p>2. The researcher may be accused of causing harm to a participant if participants are unhappy with the study items during the research due to the sensitive and personal nature.</p> <p>3. The undergraduate researcher may be asked for information outside of their knowledge or beyond the remit of an undergraduate student.</p> <p><i>0.(this box should expand as you type)</i></p> | <p><i>How you will mitigate the risk to the investigator:</i></p> <p>1. The researcher will only provide a university email address for communication and no personal contact information will be given. Any unwelcome communication will be reported to the study supervisor. Both the researcher and the study participants will be expected to behave in accordance with BPS Code of Ethics and Conduct.</p> <p>2. The researcher will not conduct any research prior to full approval from the study supervisor and ethical panel. The researcher will ensure that all UWTSD and BPS ethical guidelines and codes of conduct are followed. Any queries will be forwarded to the study supervisor. Signposting to more appropriate channels will be made available to the participant in case they do not wish to discuss issues of a personal nature with the principal researcher or study supervisor.</p> <p>3. Any issues and/or queries that the undergraduate researcher is unable to manage will be forwarded to the study supervisor along with providing public information sources such as the NHS website and student services contact information.</p> <p><i>(this box should expand as you type)</i></p> |
| 5 | <p><b>University/institutional risks</b></p> <p>For example: adverse publicity, financial loss, data protection</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|   | <p>Risk to the University:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p><i>How you will mitigate the risk to the University:</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p>1. Potential risk to the UWTSD and psychology departments reputation and integrity due to student misconduct if correct ethical guidelines and codes of conduct for human research are not followed leading to adverse publicity.</p> <p>2. Potential of risk from improper data storage leading to data exposure, leaks or being used in a way that was not the intended purpose.</p> <p><i>(this box should expand as you type)</i></p> | <p>1. The researcher will adhere to the BPS Code of Ethics and Conduct and UWTSD Research Ethics and Integrity Code of Practice throughout the study to minimise potential risk to the University. A professional and respectful manner will be maintained by the researcher throughout. Full approval will be sought through the appropriate channels before the research study commences following the UWTSD and BPS research ethics protocols. If under any circumstances the researcher is unsure during the research process, advice will be sought from the study supervisor before proceeding.</p> <p>2. Data collection and storage protocols will be followed at all times in accordance with the BPS and UWTSD Research data Management Policy. Ensuring that all data is anonymised and security protected in files on the OneDrive for the main researchers access.</p> <p><i>(this box should expand as you type)</i></p> |
| 6 | <b>Environmental risks</b><br>For example: accidental spillage of pollutants, damage to local ecosystems                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|   | Risk to the environment:<br><br>N/A<br><br><i>(this box should expand as you type)</i>                                                                                                                                                                                                                                                                                                                                                       | How you will mitigate the risk to environment:<br><br><br><br><i>(this box should expand as you type)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Disclosure and Barring Service |                                                                                                                                                                                                                   |                          |                                     |                          |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|
|                                | If the research activity involves children or vulnerable adults, a Disclosure and Barring Service (DBS) certificate must be obtained before any contact with such participants.                                   | YES                      | NO                                  | N/A                      |
| 7                              | Does your research require you to hold a current DBS Certificate?                                                                                                                                                 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8                              | If YES, please give the certificate number. If the certificate number is not available please write "Pending"; in this case any ethical approval will be subject to providing the appropriate certificate number. |                          |                                     |                          |

## SECTION I: Feedback, Consent and Confidentiality

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Feedback</b><br>What de-briefing and feedback will be provided to participants, how will this be done and when?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|   | <p>Following completion of the study the participant will be fully debriefed by the use of an online debrief form which will summarise the study purpose. Contact details for the researcher and study supervisor will be provided should the participant wish to discuss any of the topics or issues that have arisen for them. Details of public information websites such as the NHS website may be given to direct any health queries to in order to minimise any participant concerns. As there are items of a health related nature, participants will be advised to contact their GP if they have any concerns of a medical nature following their participation.</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2 | <b>Informed consent</b><br>Describe the arrangements to inform potential participants, before providing consent, of what is involved in participating. Describe the arrangements for participants to provide full consent before data collection begins. If gaining consent in this way is inappropriate, explain how consent will be obtained and recorded in accordance with prevailing data protection legislation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|   | <p>At sign up participants will be informed of the study eligibility criteria (female or female at birth, still experiencing menstruation and aged 18 or over). After sign up they will be directed to the electronic study information sheet which will detail the nature of the study, what the participant will be asked to do, and how long this should take. It will mention that they will be asked some questions of a sensitive nature, such as do they have an ADHD diagnosis, if they take prescribed medication for ADHD, and personal information about menstrual symptoms by completing online survey questionnaires. Participants will be told how to exit the study if they do not wish to continue for any reason by closing the window and reassured that there will be no consequence for doing so and they are free to stop participation at any time. Once they have had the opportunity to read all the information they will be asked to click a box to give their informed consent and agree to participate in the study and to click continue to be directed to the demographic page. Participants will be given the opportunity to end the study and not to include their data after completing all the measures where it will be explained that by clicking on submit, their data will be anonymised for confidentiality purposes and therefore unable to be removed from the study. If they are happy to continue they will be asked to click submit.</p> <p><i>(this box should expand as you type)</i></p> |
| 3 | <b>Confidentiality / Anonymity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Set out how anonymity of participants and confidentiality will be ensured in any outputs. If anonymity is not being offered, explain why this is the case.                                                                                                                                                                                                                                                                            |
|  | <p>Data collection will be carried out electronically and will be anonymised via the Qualtrics system upon the participant submitting study information to protect the confidentiality of the participant and in accordance with the Data Protection Act (2018). All data files will be stored on the secure OneDrive and accessed using a private, password protected laptop.</p> <p><i>(this box should expand as you type)</i></p> |

## SECTION J: Data Protection and Storage

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                     |                          |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|
|   | Does the research activity involve personal data (as defined by the General Data Protection Regulation 2016 “GDPR” and the Data Protection Act 2018 “DPA”)?                                                                                                                                                                                                                                                                                                                                                                                                                      | YES                                 | NO                       |
| 1 | <p><b>“Personal data”</b> means any information relating to an identified or identifiable natural person (‘data subject’). An identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person. Any video or audio recordings of participants is considered to be personal data.</p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|   | If YES, provide a description of the data and explain why this data needs to be collected:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                          |
| 2 | <p>UWTSD psychology students who participate via EMS may be identifiable by their demographic information such as age, and ADHD diagnosis and University Department.</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                      |                                     |                          |
|   | Does it involve special category data (as defined by the GDPR)?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | YES                                 | NO                       |
| 3 | <p><b>“Special category data”</b> means sensitive personal data consisting of information as to the data subjects’ –</p> <p>(a) racial or ethnic origin,</p> <p>(b) political opinions,</p> <p>(c ) religious beliefs or other beliefs of a similar nature,</p> <p>(d) membership of a trade union (within the meaning of the Trade Union and Labour Relations (Consolidation) Act 1992),</p> <p>(e) physical or mental health or condition,</p> <p>(f) sexual life,</p> <p>(g) genetics,</p> <p>(h) biometric data (as used for ID purposes),</p>                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|   | If YES, provide a description of the special category data and explain why this data needs to be collected:                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                          |
| 4 | <p>This study includes sensitive personal data about neurodivergent (ADHD) diagnosis, and medication. It’s necessary for this study to identify the possible risks for women with ADHD to</p>                                                                                                                                                                                                                                                                                                                                                                                    |                                     |                          |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>experience increased menstrual symptom severity and to measure the possible impact this may have on their quality of life.</p> <p>Sensitive personal data regarding participants experiences of menstrual symptom severity is being collected to compare different levels of severity among the 4 categorical IV's. It's necessary to raise awareness and understanding of the challenges that are faced by individuals with an ADHD diagnosis and moderate to severe dysmenorrhea symptoms, to reduce the stigma of difficulties faced by both conditions. By raising awareness, barriers to the workplace and education settings can be reduced and it can inform health professionals of individuals at potential risk to consider pain management strategies.</p> <p>The sensitive personal data in this study is health related and discusses physical (menstrual symptoms), emotional (emotion regulation difficulties) and mental health\neurodivergent (ADHD) conditions and QoL domains.</p> <p><i>(this box should expand as you type)</i></p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    | <b>Will data from the research activity (collected data, drafts of the thesis, or materials for publication) be stored in any of the following ways?</b>                                                                            | <b>YES</b>                          | <b>NO</b>                           |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 5  | Manual files (i.e. in paper form)?                                                                                                                                                                                                  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 6  | University computers?                                                                                                                                                                                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 7  | Private company computers?                                                                                                                                                                                                          | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8  | Home or other personal computers?                                                                                                                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9  | Laptop computers/ CDs/ Portable disk-drives/ memory sticks?                                                                                                                                                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 10 | "Cloud" storage or websites?                                                                                                                                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 11 | Other – specify:                                                                                                                                                                                                                    | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 12 | For all stored data, explain the measures in place to ensure the security of the data collected, data confidentiality, including details of backup procedures, password protection, encryption, anonymisation and pseudonymisation: |                                     |                                     |
|    | A personal password protected laptop will be used and all data will be stored on a password protected Onedrive.                                                                                                                     |                                     |                                     |
|    | <i>(this box should expand as you type)</i>                                                                                                                                                                                         |                                     |                                     |

| <b>Data Protection</b> |                                                                                       |                                     |                                     |
|------------------------|---------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
|                        | <b>Will the research activity involve any of the following activities:</b>            | <b>YES</b>                          | <b>NO</b>                           |
| 13                     | Electronic transfer of data in any form?                                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 14                     | Sharing of data with others at the University outside of the immediate research team? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 15                     | Sharing of data with other organisations?                                             | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 16                     | Export of data outside the UK or importing of data from outside the UK?               | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                     |                                     |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 17 | Use of personal addresses, postcodes, faxes, emails or telephone numbers?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 18 | Publication of data that might allow identification of individuals?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 19 | Use of data management system?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 20 | Data archiving?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 21 | If YES to any question, please provide full details, explaining how this will be conducted in accordance with the GDPR and Data Protection Act (2018) (and any international equivalents, where appropriate):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |                                     |
|    | <p>The use of the University EMS will be utilised to recruit participants who will only be identified by a unique ID code. The use of Qualtrics to run the study and for data collection purposes will anonymise the data with a separate ID code. The researcher will store all the datasets a security password protected file on the OneDrive, secure cloud data storage. The transfer of data to SPSS for data analysis will also be stored using a password protected file on the OneDrive. Data will be accessed using the researcher's private password protected laptop. Following completion of the study, data will be deleted in accordance with University policy on data storage.</p> <p>A written report and presentation of the final dissertation material will be shared with UWTSD academic staff.</p> <p><i>(this box should expand as you type)</i></p> |                                     |                                     |
| 22 | List all who will have access to the data generated by the research activity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |                                     |
|    | <p>Claire Macare (principal researcher, undergraduate student)<br/> Dr Stuart Jones (dissertation supervisor)<br/> Examiners on request.</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                     |                                     |
| 23 | List who will have control of, and act as custodian(s) for, data generated by the research activity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                     |                                     |
|    | <p>Claire Macare (researcher)<br/> Dr Stuart Jones (Dissertation supervisor)</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                     |                                     |
| 24 | Give details of data storage arrangements, including security measures in place to protect the data, where data will be stored, how long for, and in what form. Will data be archived – if so how and if not why not.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                     |
|    | <p>Data will be collected and stored electronically. The data will be anonymised at the point of collection once the participant has pressed submit after completing the survey so that participants cannot be identified by the dataset. All collected data will be stored in the OneDrive which is security protected and accessed via a private, password protected laptop. Data analysis will be carried out on SPSS and files will be stored on the security protected OneDrive and accessed via a private, password protected laptop. Data will be stored for the duration of the study and handled in accordance with the BPS Data Protection Regulation Guidance (2018) and UWTSD Data Protection and Storage Protocol.</p> <p><i>(this box should expand as you type)</i></p>                                                                                      |                                     |                                     |
| 25 | Please indicate if your data will be stored in the UWTSD Research Data Repository (see <a href="https://researchdata.uwtsd.ac.uk/">https://researchdata.uwtsd.ac.uk/</a> ). If so please explain. <i>(Most relevant to academic staff)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                     |                                     |
|    | <p>N/A</p> <p><i>(this box should expand as you type)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |                                     |
| 26 | Confirm that you have read the UWTSD guidance on data management (see <a href="https://www.uwtsd.ac.uk/library/research-data-management/">https://www.uwtsd.ac.uk/library/research-data-management/</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | YES                                 | <input checked="" type="checkbox"/> |
| 27 | Confirm that you are aware that you need to keep all data until after your research has completed or the end of your funding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | YES                                 | <input checked="" type="checkbox"/> |

**SECTION K: Declaration**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                |               |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------|--------------------------|
| <p>The information which I have provided is correct and complete to the best of my knowledge. I have attempted to identify any risks and issues related to the research activity and acknowledge my obligations and the rights of the participants.</p> <p>In submitting this application I hereby confirm that I undertake to ensure that the above named research activity will meet the University's Research Ethics and Integrity Code of Practice which is published on the website: <a href="https://www.uwtsd.ac.uk/research/research-ethics/">https://www.uwtsd.ac.uk/research/research-ethics/</a></p> |                                |               |                          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Signature of applicant:</b> | Claire Macaré | <b>Date:</b><br>02/10/24 |

**For STUDENT Submissions:**

|   |                                  |                                                                                    |                          |
|---|----------------------------------|------------------------------------------------------------------------------------|--------------------------|
| 2 | Director of Studies/Supervisor : | Dr Stuart Jones                                                                    | <b>Date:</b><br>02/10/24 |
| 3 | Signature:                       |  |                          |

**For STAFF Submissions:**

|   |                                    |  |              |
|---|------------------------------------|--|--------------|
| 4 | Academic Director/ Assistant Dean: |  | <b>Date:</b> |
| 5 | Signature:                         |  |              |

**Checklist:** Please complete the checklist below to ensure that you have completed the form according to the guidelines and attached any required documentation:

|                                     |                                                                                                                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | I have read the guidance notes supplied before completing the form.                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | I have completed <b>ALL RELEVANT</b> sections of the form in full.                                                                                                                                                                                         |
| <input checked="" type="checkbox"/> | I confirm that the research activity has received approval in principle                                                                                                                                                                                    |
| <input type="checkbox"/>            | I have attached a copy of final/interim approval from external organisation ( <b>where appropriate</b> )                                                                                                                                                   |
| <input type="checkbox"/>            | I have attached a full risk assessment (where appropriate) <b>ONLY TICK IF YOU HAVE ATTACHED A FULL RISK ASSESSMENT</b>                                                                                                                                    |
| <input checked="" type="checkbox"/> | I understand that it is my responsibility to ensure that the above named research activity will meet the University's Research Ethics and Integrity Code of Practice.                                                                                      |
| <input checked="" type="checkbox"/> | I understand that before commencing data collection all documents aimed at respondents (including information sheets, consent forms, questionnaires, interview schedules etc.) must be confirmed by the DoS/Supervisor, module tutor or Academic Director. |

**RESEARCH STUDENTS ONLY**

Once complete, submit this form via the **MyTSD Doctoral College Portal** at (<https://mytsd.uwtsd.ac.uk>).

**RESEARCH STAFF ONLY**

All communications relating to this application during its processing must be in writing and emailed to [pgresearch@uwtsd.ac.uk](mailto:pgresearch@uwtsd.ac.uk) , with the title 'Ethical Approval' followed by your name.

**STUDENTS ON UNDERGRADUATE OR TAUGHT MASTERS PROGRAMMES** should submit this form (and receive the outcome) via systems explained to you by the supervisor/module leader.

**Appendix J**  
**SPSS Output**

**Descriptive Statistics**

|                                       | N  | Minimum | Maximum | Mean  | Std.<br>Deviation |
|---------------------------------------|----|---------|---------|-------|-------------------|
| Please type your age in the box below | 95 | 19      | 53      | 32.02 | 10.207            |
| Valid N (listwise)                    | 95 |         |         |       |                   |

**Descriptive Statistics**

|                                        | N         | Minimum   | Maximum   | Mean      | Std.<br>Deviation | Skewness  | Std.<br>Error |
|----------------------------------------|-----------|-----------|-----------|-----------|-------------------|-----------|---------------|
|                                        | Statistic | Statistic | Statistic | Statistic | Statistic         | Statistic | Statistic     |
| Please type your age in the box below  | 95        | 19        | 53        | 32.02     | 10.207            | .286      | .200          |
| Difficulty of Emotion Regulation scale | 95        | 19.00     | 79.00     | 47.9895   | 15.32450          | .036      | .200          |
| Combined a & b MSS Total score         | 95        | 30.00     | 105.00    | 64.4421   | 16.52961          | .304      | .200          |
| Quality of Life Total score            | 95        | 19.00     | 85.00     | 50.2526   | 12.83941          | .303      | .200          |
| Valid N (listwise)                     | 95        |           |           |           |                   |           |               |

**Tests of Normality**

|                                | Kolmogorov-Smirnov <sup>a</sup> |    |       | Shapiro-Wilk |    |      |
|--------------------------------|---------------------------------|----|-------|--------------|----|------|
|                                | Statistic                       | df | Sig.  | Statistic    | df | Sig. |
| Combined a & b MSS Total score | .061                            | 95 | .200* | .984         | 95 | .286 |
| Quality of Life Total score    | .080                            | 95 | .160  | .985         | 95 | .330 |

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### Descriptive Statistics

|                                        | N  | Minimum | Maximum | Mean    | Std.<br>Deviation |
|----------------------------------------|----|---------|---------|---------|-------------------|
| Difficulty of Emotion Regulation scale | 95 | 19.00   | 79.00   | 47.9895 | 15.32450          |
| Valid N (listwise)                     | 95 |         |         |         |                   |

### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| .949             | .949                                         | 16         |

### Scale: Quality of Life

### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| .843             | .847                                         | 16         |

### Scale: Menstrual Symptom Severity (combined)

### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| .943             | .943                                         | 30         |

### Statistics

Difficulty of Emotion Regulation scale

|                |         |          |
|----------------|---------|----------|
| N              | Valid   | 95       |
|                | Missing | 0        |
| Mean           |         | 47.9895  |
| Median         |         | 47.0000  |
| Std. Deviation |         | 15.32450 |
| Minimum        |         | 19.00    |
| Maximum        |         | 79.00    |

### Do you have an ADHD diagnosis?

|       |       | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | No    | 79        | 83.2    | 83.2          | 83.2               |
|       | Yes   | 16        | 16.8    | 16.8          | 100.0              |
|       | Total | 95        | 100.0   | 100.0         |                    |

### Combined a & b MSS Total score Quality of Life Total score \* Do you have an ADHD diagnosis?

| Do you have an ADHD diagnosis? |      | Combined a & b MSS Total score | Quality of Life Total score |
|--------------------------------|------|--------------------------------|-----------------------------|
| No                             | Mean | 63.1266                        | 49.9367                     |
|                                | N    | 79                             | 79                          |

|       |                |          |          |
|-------|----------------|----------|----------|
| Yes   | Std. Deviation | 16.32472 | 12.40073 |
|       | Mean           | 70.9375  | 51.8125  |
|       | N              | 16       | 16       |
| Total | Std. Deviation | 16.50240 | 15.17550 |
|       | Mean           | 64.4421  | 50.2526  |
|       | N              | 95       | 95       |
|       | Std. Deviation | 16.52961 | 12.83941 |

### Combined a & b MSS Total score Quality of Life Total score \* Difficulty of Emotion Regulation LEVELS

| Difficulty of Emotion Regulation LEVELS |                | Combined a & b MSS Total score | Quality of Life Total score |
|-----------------------------------------|----------------|--------------------------------|-----------------------------|
| Low                                     | Mean           | 57.8085                        | 47.3191                     |
|                                         | N              | 47                             | 47                          |
|                                         | Std. Deviation | 13.97146                       | 12.39058                    |
| High                                    | Mean           | 70.9375                        | 53.1250                     |
|                                         | N              | 48                             | 48                          |
|                                         | Std. Deviation | 16.38033                       | 12.74400                    |
| Total                                   | Mean           | 64.4421                        | 50.2526                     |
|                                         | N              | 95                             | 95                          |
|                                         | Std. Deviation | 16.52961                       | 12.83941                    |

### Tests of Normality

| Difficulty of Emotion Regulation LEVELS |      | Kolmogorov-Smirnov <sup>a</sup> |    |       | Shapiro-Wilk |    |
|-----------------------------------------|------|---------------------------------|----|-------|--------------|----|
|                                         |      | Statistic                       | df | Sig.  | Statistic    | df |
| Combined a & b MSS Total score          | Low  | .083                            | 47 | .200* | .975         | 47 |
|                                         | High | .099                            | 48 | .200* | .978         | 48 |
| Quality of Life Total score             | Low  | .119                            | 47 | .095  | .962         | 47 |
|                                         | High | .080                            | 48 | .200* | .980         | 48 |

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### Tests of Normality

|                       | Do you have an ADHD diagnosis? | Kolmogorov-Smirnov <sup>a</sup> |    |       | Shapiro-Wilk |    |
|-----------------------|--------------------------------|---------------------------------|----|-------|--------------|----|
|                       |                                | Statistic                       | df | Sig.  | Statistic    | df |
| Combined a & b MSS    | No                             | .064                            | 79 | .200* | .976         | 79 |
| Total score           | Yes                            | .133                            | 16 | .200* | .967         | 16 |
| Quality of Life Total | No                             | .107                            | 79 | .025  | .972         | 79 |
| score                 | Yes                            | .130                            | 16 | .200* | .954         | 16 |

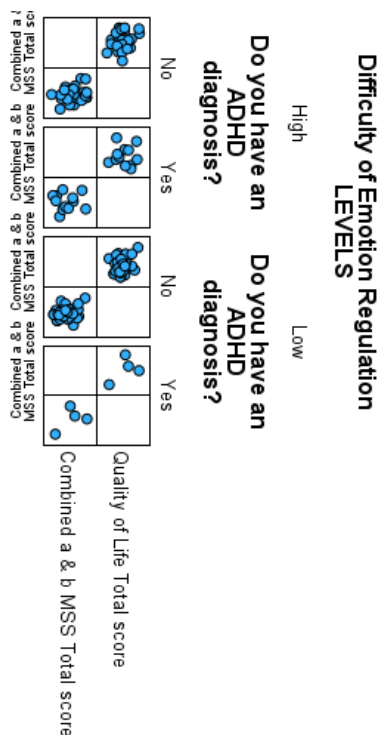
\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### Residuals Statistics<sup>a</sup>

|                                   | Minimum | Maximum | Mean  | Std. Deviation | N  |
|-----------------------------------|---------|---------|-------|----------------|----|
| Predicted Value                   | 1.03    | 1.33    | 1.17  | .067           | 95 |
| Std. Predicted Value              | -2.060  | 2.409   | .000  | 1.000          | 95 |
| Standard Error of Predicted Value | .039    | .120    | .064  | .020           | 95 |
| Adjusted Predicted Value          | 1.03    | 1.32    | 1.17  | .069           | 95 |
| Residual                          | -.296   | .917    | .000  | .370           | 95 |
| Std. Residual                     | -.791   | 2.450   | .000  | .989           | 95 |
| Stud. Residual                    | -.821   | 2.516   | .001  | 1.008          | 95 |
| Deleted Residual                  | -.323   | .967    | .001  | .384           | 95 |
| Stud. Deleted Residual            | -.820   | 2.593   | .010  | 1.025          | 95 |
| Mahal. Distance                   | .005    | 8.706   | 1.979 | 1.955          | 95 |
| Cook's Distance                   | .000    | .137    | .013  | .027           | 95 |
| Centered Leverage Value           | .000    | .093    | .021  | .021           | 95 |

a. Dependent Variable: Do you have an ADHD diagnosis?



### Correlations

|                                |                     | Combined a & b MSS Total score | Quality of Life Total score |
|--------------------------------|---------------------|--------------------------------|-----------------------------|
| Combined a & b MSS Total score | Pearson Correlation | 1                              | .283**                      |
|                                | Sig. (2-tailed)     |                                | .005                        |
|                                | N                   | 95                             | 95                          |
| Quality of Life Total score    | Pearson Correlation | .283**                         | 1                           |
|                                | Sig. (2-tailed)     | .005                           |                             |
|                                | N                   | 95                             | 95                          |

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

### Multivariate Tests<sup>a</sup>

| Effect    |                   | Value  | F                    | Hypothesis df | Error df | Sig.  |
|-----------|-------------------|--------|----------------------|---------------|----------|-------|
| Intercept | Pillai's Trace    | .929   | 590.797 <sup>b</sup> | 2.000         | 90.000   | <.001 |
|           | Wilks' Lambda     | .071   | 590.797 <sup>b</sup> | 2.000         | 90.000   | <.001 |
|           | Hotelling's Trace | 13.129 | 590.797 <sup>b</sup> | 2.000         | 90.000   | <.001 |

|                           |                    |        |                      |       |        |      |
|---------------------------|--------------------|--------|----------------------|-------|--------|------|
|                           | Roy's Largest Root | 13.129 | 590.797 <sup>b</sup> | 2.000 | 90.000 | <.00 |
| DERs_LEVELS               | Pillai's Trace     | .069   | 3.352 <sup>b</sup>   | 2.000 | 90.000 | .03  |
|                           | Wilks' Lambda      | .931   | 3.352 <sup>b</sup>   | 2.000 | 90.000 | .03  |
|                           | Hotelling's Trace  | .074   | 3.352 <sup>b</sup>   | 2.000 | 90.000 | .03  |
|                           | Roy's Largest Root | .074   | 3.352 <sup>b</sup>   | 2.000 | 90.000 | .03  |
| ADHD_status               | Pillai's Trace     | .010   | .443 <sup>b</sup>    | 2.000 | 90.000 | .64  |
|                           | Wilks' Lambda      | .990   | .443 <sup>b</sup>    | 2.000 | 90.000 | .64  |
|                           | Hotelling's Trace  | .010   | .443 <sup>b</sup>    | 2.000 | 90.000 | .64  |
|                           | Roy's Largest Root | .010   | .443 <sup>b</sup>    | 2.000 | 90.000 | .64  |
| DERs_LEVELS * ADHD_status | Pillai's Trace     | .014   | .662 <sup>b</sup>    | 2.000 | 90.000 | .51  |
|                           | Wilks' Lambda      | .986   | .662 <sup>b</sup>    | 2.000 | 90.000 | .51  |
|                           | Hotelling's Trace  | .015   | .662 <sup>b</sup>    | 2.000 | 90.000 | .51  |
|                           | Roy's Largest Root | .015   | .662 <sup>b</sup>    | 2.000 | 90.000 | .51  |

a. Design: Intercept + DERs\_LEVELS + ADHD\_status + DERs\_LEVELS \* ADHD\_status

b. Exact statistic

c. Computed using alpha = .05

### Box's Test of Equality of Covariance Matrices<sup>a</sup>

|         |         |
|---------|---------|
| Box's M | 5.228   |
| F       | .509    |
| df1     | 9       |
| df2     | 772.327 |
| Sig.    | .869    |

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept  
+ DERs\_LEVELS +  
ADHD\_status +  
DERs\_LEVELS \*  
ADHD\_status

### Levene's Test of Equality of Error Variances<sup>a</sup>

|                                   |                                         | Levene<br>Statistic | df1 | df2    | Sig. |
|-----------------------------------|-----------------------------------------|---------------------|-----|--------|------|
| Combined a & b MSS<br>Total score | Based on Mean                           | .349                | 3   | 91     | .790 |
|                                   | Based on Median                         | .315                | 3   | 91     | .814 |
|                                   | Based on Median and<br>with adjusted df | .315                | 3   | 88.678 | .814 |
|                                   | Based on trimmed<br>mean                | .357                | 3   | 91     | .784 |
| Quality of Life Total<br>score    | Based on Mean                           | .863                | 3   | 91     | .463 |
|                                   | Based on Median                         | .838                | 3   | 91     | .477 |
|                                   | Based on Median and<br>with adjusted df | .838                | 3   | 85.355 | .477 |
|                                   | Based on trimmed<br>mean                | .859                | 3   | 91     | .465 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + DERs\_LEVELS + ADHD\_status + DERs\_LEVELS \* ADHD\_status

### Tests of Between-Subjects Effects

| Source                    | Dependent Variable             | Type III Sum of Squares | df | Mean Square | F       |
|---------------------------|--------------------------------|-------------------------|----|-------------|---------|
| Corrected Model           | Combined a & b MSS Total score | 4311.327 <sup>a</sup>   | 3  | 1437.109    | 6.119   |
|                           | Quality of Life Total score    | 1005.624 <sup>b</sup>   | 3  | 335.208     | 2.105   |
| Intercept                 | Combined a & b MSS Total score | 180104.199              | 1  | 180104.199  | 766.863 |
|                           | Quality of Life Total score    | 109413.510              | 1  | 109413.510  | 687.123 |
| DERs_LEVELS               | Combined a & b MSS Total score | 1590.449                | 1  | 1590.449    | 6.772   |
|                           | Quality of Life Total score    | 66.037                  | 1  | 66.037      | .415    |
| ADHD_status               | Combined a & b MSS Total score | 183.202                 | 1  | 183.202     | .780    |
|                           | Quality of Life Total score    | 43.599                  | 1  | 43.599      | .274    |
| DERs_LEVELS * ADHD_status | Combined a & b MSS Total score | .131                    | 1  | .131        | .001    |
|                           | Quality of Life Total score    | 204.759                 | 1  | 204.759     | 1.286   |

|                 |                                |            |    |         |  |
|-----------------|--------------------------------|------------|----|---------|--|
| Error           | Combined a & b MSS Total score | 21372.105  | 91 | 234.858 |  |
|                 | Quality of Life Total score    | 14490.313  | 91 | 159.234 |  |
| Total           | Combined a & b MSS Total score | 420198.000 | 95 |         |  |
|                 | Quality of Life Total score    | 255402.000 | 95 |         |  |
| Corrected Total | Combined a & b MSS Total score | 25683.432  | 94 |         |  |
|                 | Quality of Life Total score    | 15495.937  | 94 |         |  |

a. R Squared = .168 (Adjusted R Squared = .140)

b. R Squared = .065 (Adjusted R Squared = .034)

c. Computed using alpha = .05

### Estimates

| Dependent Variable             | Difficulty of Emotion Regulation LEVELS | Mean   | Std. Error | 95% Confidence Interval |             |
|--------------------------------|-----------------------------------------|--------|------------|-------------------------|-------------|
|                                |                                         |        |            | Lower Bound             | Upper Bound |
| Combined a & b MSS Total score | Low                                     | 59.596 | 4.006      | 51.639                  | 67.552      |
|                                | High                                    | 71.958 | 2.554      | 66.885                  | 77.032      |
| Quality of Life Total score    | Low                                     | 50.009 | 3.298      | 43.457                  | 56.560      |
|                                | High                                    | 52.528 | 2.103      | 48.350                  | 56.705      |

### Pairwise Comparisons

| Dependent Variable | (I) Difficulty of Emotion Regulation LEVELS | (J) Difficulty of Emotion Regulation LEVELS | Mean Difference (I-J) | S.E. | Sig. |
|--------------------|---------------------------------------------|---------------------------------------------|-----------------------|------|------|
|                    |                                             |                                             |                       |      |      |

|                       |      |      |          |   |
|-----------------------|------|------|----------|---|
| Combined a & b MSS    | Low  | High | -12.362* | 4 |
| Total score           | High | Low  | 12.362*  | 4 |
| Quality of Life Total | Low  | High | -2.519   | 3 |
| score                 | High | Low  | 2.519    | 3 |

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

### Multivariate Tests

|                       | Value | F                  | Hypothesis<br>df | Error df | Sig. | Partial Eta<br>Squared | Noncent<br>Paramete |
|-----------------------|-------|--------------------|------------------|----------|------|------------------------|---------------------|
| Pillai's trace        | .069  | 3.352 <sup>a</sup> | 2.000            | 90.000   | .039 | .069                   | 6.7                 |
| Wilks' lambda         | .931  | 3.352 <sup>a</sup> | 2.000            | 90.000   | .039 | .069                   | 6.7                 |
| Hotelling's<br>trace  | .074  | 3.352 <sup>a</sup> | 2.000            | 90.000   | .039 | .069                   | 6.7                 |
| Roy's largest<br>root | .074  | 3.352 <sup>a</sup> | 2.000            | 90.000   | .039 | .069                   | 6.7                 |

Each F tests the multivariate effect of Difficulty of Emotion Regulation LEVELS. These tests are based on linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

b. Computed using alpha = .05

### Univariate Tests

| Dependent Variable    |          | Sum of<br>Squares | df | Mean<br>Square | F     | Sig. |
|-----------------------|----------|-------------------|----|----------------|-------|------|
| Combined a & b MSS    | Contrast | 1590.449          | 1  | 1590.449       | 6.772 | .011 |
| Total score           | Error    | 21372.105         | 91 | 234.858        |       |      |
| Quality of Life Total | Contrast | 66.037            | 1  | 66.037         | .415  | .521 |
| score                 | Error    | 14490.313         | 91 | 159.234        |       |      |

The F tests the effect of Difficulty of Emotion Regulation LEVELS. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

### Estimates

| Dependent Variable | Do you have an ADHD<br>diagnosis? | Mean   | Std.<br>Error | 95% Confidence<br>Interval |                |
|--------------------|-----------------------------------|--------|---------------|----------------------------|----------------|
|                    | No                                | 63.679 | 1.731         | Lower<br>Bound             | Upper<br>Bound |
|                    |                                   |        |               | 60.241                     | 67.118         |

|                       |     |        |       |        |        |
|-----------------------|-----|--------|-------|--------|--------|
| Combined a & b MSS    | Yes | 67.875 | 4.424 | 59.087 | 76.663 |
| Total score           |     |        |       |        |        |
| Quality of Life Total | No  | 50.245 | 1.425 | 47.414 | 53.076 |
| score                 | Yes | 52.292 | 3.643 | 45.056 | 59.528 |

### Pairwise Comparisons

| Dependent Variable                | (I) Do you have an ADHD diagnosis? | (J) Do you have an ADHD diagnosis? | Mean Difference (I-J) | Sig. |
|-----------------------------------|------------------------------------|------------------------------------|-----------------------|------|
| Combined a & b MSS<br>Total score | No                                 | Yes                                | -4.196                | .844 |
|                                   | Yes                                | No                                 | 4.196                 | .844 |
| Quality of Life Total<br>score    | No                                 | Yes                                | -2.047                | .318 |
|                                   | Yes                                | No                                 | 2.047                 | .318 |

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

### Multivariate Tests

|                    | Value | F                 | Hypothesis df | Error df | Sig. | Partial Eta Squared | Noncent. Parameter |
|--------------------|-------|-------------------|---------------|----------|------|---------------------|--------------------|
| Pillai's trace     | .010  | .443 <sup>a</sup> | 2.000         | 90.000   | .644 | .010                | .844               |
| Wilks' lambda      | .990  | .443 <sup>a</sup> | 2.000         | 90.000   | .644 | .010                | .844               |
| Hotelling's trace  | .010  | .443 <sup>a</sup> | 2.000         | 90.000   | .644 | .010                | .844               |
| Roy's largest root | .010  | .443 <sup>a</sup> | 2.000         | 90.000   | .644 | .010                | .844               |

Each F tests the multivariate effect of Do you have an ADHD diagnosis?. These tests are based on independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

b. Computed using alpha = .05

### Univariate Tests

| Dependent Variable                |          | Sum of Squares | df | Mean Square | F    | Sig. |
|-----------------------------------|----------|----------------|----|-------------|------|------|
| Combined a & b MSS<br>Total score | Contrast | 183.202        | 1  | 183.202     | .780 | .379 |
|                                   | Error    | 21372.105      | 91 | 234.858     |      |      |
| Quality of Life Total<br>score    | Contrast | 43.599         | 1  | 43.599      | .274 | .602 |
|                                   | Error    | 14490.313      | 91 | 159.234     |      |      |

The F tests the effect of Do you have an ADHD diagnosis?. This test is based on the linearly independent estimated marginal means.

a. Computed using  $\alpha = .05$