Self-Determination Towards Regular Exercise Relates to Quality of Life in Female College Students With at Least One Child

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Self-Determination Towards Regular Exercise Relates to Quality of Life in Female College Students With at Least One Child

Toby Khung ChiLai Roylance

A thesis submitted to the faculty of Brigham Young University in partial fulfillment of the requirements for the degree of Master of Arts

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ABSTRACT

Self-Determination Towards Regular Exercise Relates to Quality of Life in Female College Students With at Least One Child

Toby Khung ChiLai Roylance
Department of Teacher Education, BYU
Master of Arts

Inspired by one of my daughters, Rachel Tam, and her journeys through motherhood while pursuing an MBA at Brigham Young University, this study was conceived from observing her struggle to balance academic responsibilities, motherhood, being a wife, and prenatal care. Her experience highlighted the significance of self-directed physical activity (PA) for young mothers pursuing higher education in a religious institution.

This study explores the dynamics of PA, motivation, and well-being among 264 college-attending mothers from Brigham Young University Provo and BYU-Pathway Worldwide. These participants were selected from an online survey pool of over 1,500 female student respondents. All mothers in the study have at least one biological child living with them at least half of the time and provided insights through 36 tailored questions. The research is grounded in Self-Determination Theory (SDT). It utilized the Godin Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ) to assess activity levels, the Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2) for motivational regulation, and the World Health Organization Five Well-Being Index (WHO-5) to measure well-being.

The vast majority of participants—over 98% affiliated with The Church of Jesus Christ of Latter-day Saints (The Church), predominantly married freshmen or graduate students, about 75% in their twenties and thirties with young children under 6—demonstrate a notable dedication to physical activity (PA). This dedication surpasses both the average engagement levels of general college female students nationwide and the U.S. PA guidelines. This robust commitment is largely driven by a modest level of intrinsic motivation, potentially correlated with adherence to BYU’s health code, the Word of Wisdom, and personal beliefs. Despite facing challenges in balancing academic responsibilities and parenting duties, over 61% of these mothers maintain moderate overall well-being. The motivation analysis reveals an SDT simplex pattern, indicating a significant, positive, but low correlation between intrinsic motivation and enhanced life quality through active PA participation. This suggests that various unique group factors may be associated with the expected SDT relationship between PA, intrinsic motivation, and well-being.

Keywords: self-determination, college-attending mother, religious institution, physical activity, well-being, quality of life
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CHAPTER 1

Introduction

In medicine, the transition to motherhood is defined as a multifaceted process that involves adapting to new stressors, physical pain, lactation, and attachment (Bell et al., 2014). Studies have shown a correlation between life events during the transition to motherhood and decreased physical activity (PA) levels among women (Gropper et al., 2020; Limbers et al., 2020). This correlation holds particular significance for mothers who are also pursuing higher education, as they are at a higher risk of engaging in low levels of PA (Saaty et al., 2015). Compounding this challenge are cultural expectations of maternal care, which often lead these mothers to prioritize the needs of others over their own well-being (Lloyd et al., 2014; Sport England, 2019).

A recent survey conducted by Sport England (2019) revealed that 61% of mothers experience feelings of guilt when taking time to exercise, resulting in regular exercise and self-care being deprioritized, with only 17% of mothers prioritizing PA (Sport England, 2019). Mothers encounter various obstacles that hinder their engagement in PA, including family obligations, societal pressures, and an emphasis on external appearance rather than overall well-being (American College Health Association [ACHA], 2019). Currie and Develin (2002) found that a significant proportion of women in the postnatal period expressed a desire to exercise more. Over 1,000 mothers of children aged 0–6 participated in a survey, and over three-quarters wanted to increase their PA levels (Sport England, 2019).

For college-attending mothers, this dynamic is further intensified. Balancing academic responsibilities with parenting duties (National Center for Education Statistics [NCES], 2021; United States Government Accountability Office [USGAO], 2021), these mothers frequently
encounter additional pressures that can exacerbate their tendency to neglect personal health pursuits in favor of family and educational commitments (Lloyd et al., 2014; Sport England, 2019).

Regular PA can significantly benefit mothers experiencing stressful and demanding situations, particularly postpartum ones (Daley et al., 2012). According to the first meta-analysis on PA during pregnancy and its relationship with postpartum depression conducted by Nakamura et al. (2019), regular PA can aid in postpartum recovery, alleviate stress, and lead to improvements in mood, sleep quality, and energy levels. Research suggests that even short bouts of exercise can positively relate to a new mother’s physical and mental health (Daley et al., 2012). Exercise has been found to help regulate mood, reduce symptoms of depression and anxiety, and improve cognitive function (Arida & Teixeira-Machado, 2021), which can be particularly important for new mothers adjusting to the demands of caring for a newborn (Daley et al., 2012). Moreover, regular PA is associated with overall physical health and fitness, which may benefit mothers and their families in the long term (Arevalo et al., 2023; Hulen, 2022). For example, exercise is linked to managing weight, reducing the risk of chronic diseases, and improving cardiovascular health (Daley & Pritchett, 2018), with potential benefits in treating and preventing dementia (Daley et al., 2012).

Conversely, insufficient PA is correlated with postpartum obesity among college-attending mothers, which in turn is linked to an increased risk of depression and other health complications (Stanton et al., 2014). Obesity and depression are prevalent issues that pose significant health risks to the mother and her child (Rivera et al., 2015). Therefore, improving maternal health is crucial not only for the well-being of mothers but also for their children, families, and the broader community (Arevalo et al., 2023; Deierlein et al., 2011; Hulen, 2022).
Maternal illnesses and preventable maternal deaths can have a significant and lasting relationship with nutrition, education, and economic stability (Larson-Meyer et al., 2010). Adequate nutrition is strongly correlated with the health of pregnant women and their babies, while education is positively related to women's knowledge about health practices and access to healthcare services. Economic stability is directly linked to the ability of women to afford nutritious food, healthcare, and education. Therefore, improvements in these areas are significantly associated with a reduction in maternal illnesses and preventable maternal deaths, ultimately leading to better health outcomes for mothers and their families. Moreover, the consequent decline in systemic welfare and personal well-being can extend across generations (Hoffmann et al., 2021; Kaiser Family Foundation, 2022; Lloyd et al., 2014).

**Why Mothers?**

Women often internalize stress in the form of depression, which is associated with lower levels of exercise (Rosenfield & Mouzon, 2013). The prevalence of major depression is twice as high in women as in men (Albert, 2015; Kuehner, 2017). During a depressive episode, the person experiences significant difficulty in personal, family, social, educational, occupational, and/or other important areas of functioning (World Health Organization, 2021).

A woman undergoes hormonal, physical, emotional, and psychological changes throughout pregnancy. Tremendous changes occur in the mother’s familial and interpersonal world. Around one in seven women can develop postpartum depression (Mughal et al., 2022). Mothers who engage in PA experience less psychological stress related to being a mother (Daley et al., 2012) and feel more able to cope with the demands of motherhood (Hamilton et al., 2012). For mothers, the risks include pre-eclampsia, decreased breastfeeding initiation and duration, and poor bonding with her child (Sullivan et al., 2015). This group would greatly benefit from
assistance in establishing a healthy lifestyle involving PA. Regrettably, fewer than 25% of women adhere to the U.S. Physical Activity Guidelines during or after pregnancy (Hesketh & Evenson, 2016).

The 2019 Sport England study elucidates the correlation between mothers’ high interest in increasing their participation in sports and exercise and the significant barriers that inhibit this involvement. Notably, it identifies a lack of time and fear of judgment concerning physical appearance, age, or ability as principal obstacles (Sport England, 2019).

**College Students vs. College-Attending Mothers at a Worldwide Religious Institution**

This study explores the associations between religious traditions and gender disparities in PA levels among college-attending mothers at a global religious university. It builds on existing research that identifies a decline in PA during college years. Lauderdale et al. (2015) note that female college students engage in less PA than their male counterparts. Further studies reveal that motherhood intensifies this gender disparity; females with children engage in lower levels of PA than those without (Abell et al., 2019; Hesketh & Evenson, 2016; Hull et al., 2010). Additionally, Saaty et al. (2015) find that adding another child significantly reduces PA levels among females, a pattern not observed among males. These findings underscore the correlation between gender, parental status, and PA levels, indicating an interaction where social and familial responsibilities, potentially associated with religious cultural norms, correspond with varying PA levels.

The childcare demands considerably relate to female college students, as they typically spend more than twice the amount of time caring for and raising a child than their male counterparts (Hull et al., 2010). Additionally, in many religious traditions, females are expected to conform to traditional gender roles, further exacerbating their responsibilities as primary
caregivers (Gropper et al., 2020; Limbers et al., 2020; Lloyd et al., 2014; Schmidt et al., 2022). These cultural and religious expectations often prioritize the needs of families and communities over personal well-being (Smith, 2014), which can limit opportunities for engaging in PA (Lloyd et al., 2014). Consequently, family responsibilities and religious traditions may burden new mothers, hindering their ability to maintain sufficient PA levels (Hesketh & Evenson, 2016).

Religious traditions can exacerbate the lack of time in the lives of college-attending mothers, intensifying the challenges they face in maintaining regular exercise routines. Research consistently identifies limited availability of time as the primary obstacle cited by mothers for their reduced physical activity (Sport England, 2019). A representative survey conducted by Opinium, involving 1,006 mothers with children aged 0–6 years, reveals that nearly one-third (30%) of mothers have less than an hour of free time for themselves each day (Sport England, 2019). Within religious traditions, societal expectations surrounding motherhood further compound these time constraints, significantly restricting mothers’ ability to engage in physical activity (Schmidt et al., 2022).

Recognizing the substantial barriers motherhood imposes, promoting self-determination in exercise and sports participation has emerged as a critical concern for various public health organizations, as highlighted by Samson and Solmon (2011).

**Self-Determination Theory in Exercise**

Vansteenkiste et al. (2020) and Comim and Nussbaum (2014) stated that humans’ most crucial and primary needs are physical health and autonomy of agency. Self-Determination Theory (SDT) is an empirically derived theory mainly concerned with how social-contextual factors support or thwart people from thriving by satisfying their basic psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2012; Ryan & Deci, 2017). SDT also
considers the significance of these essential needs and processes within domains such as health care, education, work, sport, religion, and psychotherapy (Ryan & Deci, 2017, 2000).

This study utilized an SDT framework to examine the relationship between regular exercise and the well-being of female college students who also served as mothers and primary caregivers. Specifically, it focused on those caring for at least one biological child under the age of 6, with whom they resided at least 50% of the time and the hormonal changes and experiences they undergo during the prenatal and postnatal stages. The research was conducted at Brigham Young University (BYU), a prominent private religious university supported by The Church of Jesus Christ of Latter-day Saints (the Church), and within its online degree entry program, BYU-Pathway Worldwide.

Recognizing the strong emphasis the Church places on education, often viewed as a commandment by its leaders, referred to as prophets and apostles who guide the Church (The Church, n.d.; Uchtdorf, 2009). The study investigated how SDT relates to three fundamental psychological needs: autonomy, competence, and relatedness, which are essential for human growth and development (Deci & Ryan, 2000, 2012; Ryan & Deci, 2017). Granero-Jiménez et al. (2022) found that it could positively relate to the physical and psychological well-being of a distinct group of female students. These students, who concurrently pursued higher education and navigated the complexities of modern motherhood within a religious community, were predominantly affiliated with the Church, with over 98% of students at BYU being members (Eyre, 2019).

**Quantitative Survey Study**

This cross-sectional survey study used quantitative methods to examine college-attending mothers’ PA behaviors, motivational regulations, and overall well-being. It utilized three well-
established and reliable self-report questionnaires (Godin, 2011; Kovács & Kovács, 2021; Markland & Tobin, 2004; Motl et al., 2018; Sischka et al., 2020; Topp et al., 2015), including the Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ), the Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2), and the World Health Organization’s Five Well-Being Questionnaires (WHO-5).

The GSLTPAQ, comprising three items, evaluated leisure-time PA by capturing the frequency and duration of moderate and strenuous activities over the past month (Godin, 2011; Motl et al., 2018). Calculated scores categorized participants into active, moderately active, or insufficiently active groups.

The BREQ-2, consisting of 19 items across five subscales, assessed motivational regulations towards exercise, including external regulation, introjected regulation, identified regulation, intrinsic motivation, and amotivation (Kovács & Kovács, 2021; Markland & Tobin, 2004). Participants rated each item on a 5-point Likert scale, providing insights into their level of autonomous motivation.

The WHO-5 questionnaire, consisting of five items, measured overall well-being by assessing positive mood, vitality, and general interest experienced in the previous two weeks (Sischka et al., 2020; Topp et al., 2015). Ratings were provided on a 6-point Likert scale, with scores converted into percentages representing the individual’s quality of life.

The findings helped elucidate the relationships between college-attending mothers’ PA engagement and well-being outcomes by applying these questionnaires.

**Statement of the Purpose**

The purpose of this survey study is to explore key aspects of PA among college-attending mothers at BYU, including (a) their habitual levels of PA, (b) their motivational profiles, and (c)
their overall sense of well-being in relation to habitual PA. By delving into these factors, the study aims to illuminate the complex dynamics that shape PA behaviors and their relationship to the overall quality of life for these mothers.

**Research Hypotheses**

The hypothesis suggests that at BYU, the participation of college-attending mothers in regular PA is associated with a complex array of motivational dynamics and perceived obstacles. Despite an inherent motivation to exercise, tangible constraints may relate to inconsistent activity levels. Moreover, the values inherent in BYU’s environment may be associated with an increased significance of PA, aligning it with these mothers’ personal values and beliefs, thus potentially fostering more consistent and meaningful exercise habits. Additionally, the interconnection of self-determined motivation and the University’s religious-cultural context is believed to be significantly related to the well-being of the student mothers.
CHAPTER 2

Review of Literature

This literature review delves into the motivation and engagement of college-attending mothers in PA despite encountering many challenges. These challenges include societal expectations, familial responsibilities, and the pervasive pressure to conform to aesthetic standards, such as prioritizing appearance over health. This phenomenon was thoroughly examined in the research conducted by Pykkonen (2021) and Canada’s Sport Information Resource Centre (2022). In this context, Ryan and Deci’s (2017) SDT is used as a theoretical framework to identify the factors that may hinder or facilitate PA among college-attending mothers at a religious institution. This review examines the crucial components of autonomy, competence, and exercise-relatedness that are positively associated with mothers’ physical and psychological health and well-being (Deci & Ryan, 2012; Ryan & Deci, 2017)

Female College Students & College-Attending Mothers

The U.S. Department of Health and Human Services (USDHHS; 2018) recommends that adults engage in at least 150 to 300 minutes (about 5 hours) of moderate-intensity or 75 to 150 minutes (about 2 and a half hours) of vigorous-intensity aerobic PA per week for substantial health benefits (American College of Sports Medicine [ACSM], 2019). Notwithstanding the above, the American College Health Association’s National College Health Assessment II (ACHA-NCHA II) Spring 2019 report revealed that female college students are less likely to meet PA guidelines than male college students (ACHA, 2019). Faro et al. (2019) emphasized the significance of PA in providing psychological, physiological, and psychosocial health benefits for female college students. Nevertheless, research suggests that many female college students need help to meet the recommended PA guidelines (ACHA, 2019).
According to the NCES (2018), more than one out of five college students in the United States, equivalent to 22%, are parents. USGAO, (2021) reports that 4.3 million college students are raising a child, with over half, 53%, having preschool-age or younger children. In terms of gender distribution, 70% of student parents are mothers, of whom 62% of them are raising their children as single mothers (Dundar et al., 2023; Gault, 2019; USGAO, 2021), highlighting a significant proportion of them undertaking their academic and parenting responsibilities solo (Gault, 2019). Moreover, many mothers in college are in their 30s or younger, and almost half of them work full-time (Dundar et al., 2023; Gault, 2019; USGAO, 2021).

The challenges college-attending mothers face in juggling their roles as caregivers, students, and potential breadwinners are evident in the statistics (Dundar et al., 2023; Gault, 2019; Goldberg et al., 2012; USGAO, 2021). These responsibilities can place significant strain on mothers, as indicated by findings from the study conducted by Stanton et al. (2014). The study revealed that college-attending mothers have distinct experiences and specific needs related to exercise. These also include difficulties finding time for PA (Doorley et al., 2023) while balancing academics, parenting, marital and financial responsibilities, and managing a potential lack of social support (Mahaffey et al., 2015). These findings highlight the intricate and complex nature of the challenges faced by college-attending mothers and emphasize the importance of addressing their unique needs in promoting their overall well-being.

Given the multitude of demands and challenges inherent to mothers, it is no surprise that college-attending mothers struggle to find time for exercise (Doorley et al., 2023). A study by McKeon et al. (2022) identified several particularly salient needs for this population concerning exercise, including access to affordable childcare, flexible class schedules that allow for time to exercise, financial support to afford gym memberships or exercise equipment, and emotional
support from family and friends to maintain motivation and overcome barriers. Meeting these needs could make exercising more accessible and feasible for college-attending mothers, who often feel isolated and overwhelmed by the competing demands of motherhood and college (Zambito, 2017).

**Gendered & Societal Expectations**

Female college students, particularly mothers, often face obstacles when engaging in PA due to family obligations, societal norms, and the pervasive association of gendered expectations prioritizing caregiving and familial responsibilities over personal health and fitness (ACHA, 2019). Research has indicated that the cultural expectation of maternal care can compound the challenge of maintaining PA during the transition to motherhood (Gropper et al., 2020; Limbers et al., 2020). Mothers often find themselves expected to prioritize the needs of others over their own, resulting in reduced opportunities for PA (Lloyd et al., 2014; Schmidt et al., 2022). Balancing conflicting roles can lead to feelings of guilt, stress, anxiety, and depression among college-attending mothers (Martínez et al., 2011; Sealey-Ruiz, 2013).

Furthermore, college-attending mothers often feel isolated and unsupported in their exercise efforts, facing a lack of support from peers, faculty/staff, and the school environment (Ajayi, 2021; Limbers et al., 2020; Sealey-Ruiz, 2013). Racial and ethnic minority college-attending mothers, including Black and Hispanic women who represent a significant portion of this demographic, also report experiencing discrimination and judgment for their decision to have children while pursuing their higher education (Ajayi, 2021; Cruse et al., 2020; Sealey-Ruiz, 2013).

A recent scoping review by Schmidt et al. (2022) delved into social norms surrounding motherhood and how mothers adapt to these expectations. The findings revealed that mothers are
often expected to devote considerable time and effort to their children, consistently prioritizing their well-being above their own and fostering strong emotional bonds (Berghammer & Milkie, 2021; Faircloth, 2014; Hamilton, 2016; Hulen, 2022). Additionally, cultural expectations in Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies often emphasize selflessness, with mothers expected to prioritize the needs of their spouses, families, and communities ahead of their own (Goldberg et al., 2012; Schmidt et al., 2022). The term WEIRD was introduced by Henrich et al. (2010) to underscore the limited diversity in psychological research subjects, highlighting its implications for the generalizability of research findings (Apicella et al., 2020).

In these settings, women frequently assume multiple roles—coordinating family life, fulfilling duties as mothers, wives, housekeepers, volunteers, and even breadwinners (Goldberg et al., 2012; Martínez et al., 2011; Schmidt et al., 2022). Moreover, the dual burdens of family obligations and societal norms can significantly restrict college-attending mothers’ ability to engage in self-care, access gym facilities, or participate in group exercise classes, thereby limiting their opportunities for PA (Saligheh et al., 2016; Schmidt et al., 2022).

**Societal Aesthetic Standards**

In contemporary society, college-attending mothers encounter various challenges associated with societal aesthetic standards. Women are often subjected to societal expectations regarding their physical appearance, which can potentially relate to their self-esteem, body image, and overall well-being (Pykkonen, 2021). Within this context, college-attending mothers may experience additional pressures and anxieties stemming from societal aesthetic standards and expectations associated with motherhood (Mughal et al., 2022).
One main category of societal aesthetic standards that college-attending mothers face involves body image expectations (Rodgers et al., 2024). Women are often subjected to societal pressures to conform to specific body shapes or sizes, and college-attending mothers may feel compelled to meet these expectations (Pykkonen, 2021; Rodgers et al., 2024). This pressure can arise from various sources, including media representations, peers, and healthcare providers (Pykkonen, 2021). College-attending mothers may experience self-consciousness regarding their post-pregnancy bodies and feel pressured to rapidly lose weight or revert to their pre-pregnancy size (Rodgers et al., 2024). Such pressures are associated with negative body image, which is correlated with self-esteem and confidence (Lovering, 2016; Pykkonen, 2021; Rodgers et al., 2024).

The research conducted by Hwang et al. (2022) yielded significant findings that prompted a reevaluation of various motivational aspects, including body image, identity, maternal well-being, formation of attachments, shifts in relationship priorities, and increased confidence in role performance. These outcomes indicate the multidimensional nature of the adaptation process inherent in motherhood, transcending specific dimensions such as the physical or psychological (Hwang et al., 2022; Rodgers et al., 2024).

Moreover, college-attending mothers may encounter appearance-related stereotypes that correlate with their academic performance and mental well-being (Pykkonen, 2021). They might face assumptions that they are less competent or less dedicated to their studies due to their motherhood status (Morgan et al., 2021), potentially exacerbating the challenges associated with body image. Overcoming these stereotypes can be particularly challenging within a college environment, where students are often evaluated based on their academic achievements and ability to manage multiple responsibilities effectively (Lovering, 2016).
Considering these pressures, college-attending mothers might experience reluctance to participate in gym activities or outdoor exercises, particularly in the first 2 years after childbirth, due to concerns about body image (Rodgers et al., 2024). This hesitation directly results from the intense societal and cultural focus on aesthetics, complicating these mothers’ challenges (Pykkonen, 2021). The obligation to adhere to specific beauty standards can evoke guilt or shame, negatively relating to their overall well-being (Pykkonen, 2021). Moreover, the strain of fulfilling various roles while trying to meet these societal expectations can harm their mental and physical health (Rodgers et al., 2024).

Cultures & Religions

Most college-attending mothers face academic challenges in balancing their PA with their responsibilities as parents, and these difficulties are even more pronounced for mothers from collectivist cultures (Goldberg et al., 2012). Collectivism often contrasts with individualism, where individual autonomy, self-reliance, and personal freedom are emphasized. In collectivist cultures, individuals may be expected to prioritize the needs of their family, community, nation, or even God over their personal interests (Adini et al., 2022; Biard, 2021; Sartori & Rosenbaum, 2021)

Demographics of College-Attending Mothers

According to the 2015–2016 National Postsecondary Student Aid Study (NPSAS:16) conducted by the U.S. Department of Education’s National Center for Education Statistics (NCES, 2018), more than half (51%) of all college student parents were people of color (Dundar et al., 2023; Gault, 2019; NCES, 2017). The study found that 33% of student parents were African American, 21% were Hispanic, 13% were Asian, and over 20% identified as more than one race. Moreover, research indicates that two in five Black women in college are mothers, and
over one-third of American Indian/Alaska Native and Native Hawaiian/Pacific Islander students are mothers (Doorley et al., 2023; Dundar et al., 2023; Gault, 2019)

**College-Attending Mothers From Collectivist Cultures**

Recognizing the cultural backgrounds of college-attending mothers can offer critical insights into the unique pressures they face, particularly in adhering to collectivist gender roles and prioritizing community needs over individual interests (Adini et al., 2022; Biard, 2021; Sartori & Rosenbaum, 2021). A substantial number of these mothers in the United States hail from collectivist cultures, representing a diverse array of racial and ethnic backgrounds including African American, Hispanic, Asian, Middle Eastern, American Indian/Alaska Native, and Native Hawaiian/Pacific Islander communities (Doorley et al., 2023; Dundar et al., 2023; Gault, 2019; Smith, 2014). While the United States is predominantly viewed as an individualistic society, where personal achievements and autonomy are highly valued (Zolduoarrati et al., 2022), these mothers often bring contrasting cultural perspectives that emphasize community, cooperation, and family ties. This dichotomy between individualistic and collectivistic orientations highlights the rich diversity of experiences and values among college-attending mothers and enriches the educational landscape, potentially influencing learning and collaborative approaches. In both cultural paradigms, a mother’s role is critically important for maintaining social relationships and promoting harmony, thereby underscoring the universal association of maternal roles with social harmony across diverse communities.

Mothers are linked to the well-being of their family members and foster community cohesion through their caregiving, emotional support, cultural transmission, and the perpetuation of these practices to their children (Smith, 2014). Given their parental responsibilities, college-attending mothers may encounter challenges finding the time and obtaining support for PA
Consequently, additional traditions and cultural and societal factors are associated with the ability of many college-attending mothers to prioritize exercise and self-care (Goldberg et al., 2012; Schmidt et al., 2022).

**Religious Tradition**

According to Sherkat (2015), religious traditions encompass comprehensive systems of beliefs, practices, and institutions that shape a specific type of religiosity. For college-attending mothers, religious traditions can play a significant role in their lives, providing a sense of belonging, support, and guidance in navigating their roles as caregivers, students, and individuals, particularly in fostering prosocial behaviors (Adini et al., 2022; Biard, 2021; Sartori & Rosenbaum, 2021). Consequently, religious affiliation may relate to how mothers decide to prioritize their well-being or how they use their time. As Wittek and Bekkers (2015) described, prosocial behavior encompasses a wide range of behaviors characterized by self-sacrifice for the benefit of others. It involves incurring personal costs while generating benefits for those being helped (Chung, 2021). When examining college-attending mothers, it is evident that their prosocial behaviors can manifest in various ways within their religious communities and social networks (Adini et al., 2022; Biard, 2021; Editors of Encyclopedia Britannica, 2024; Sartori & Rosenbaum, 2021). They may actively engage in mutualism, where their actions benefit both themselves and others, such as participating in support groups or mentoring fellow mothers (Mobbs et al., 2021). Islamic teachings do not prohibit Muslim women from participating in physical activities; indeed, activities such as swimming, archery, and horseback riding are particularly encouraged (Nicaise & Kahan, 2013; Shanunu et al., 2021). However, studies indicate that Muslim women are significantly less involved in sports and recreational activities in Western countries compared to the general female population (Khamis, 2024).
underrepresentation has been associated with several factors, including non-inclusive practices within sports organizations, restrictive cultural attitudes and values, the lack of facilities with culturally appropriate clothing options, and a scarcity of female-only sports environments (Shanunu et al., 2021). Furthermore, college-attending Muslim mothers often prioritize the well-being and needs of their children and family above their own time and resources (Khamis, 2024; Schulz et al., 2020; Wittek & Bekkers, 2015), which may exacerbate challenges. Specific religious restrictions also present significant obstacles for Islamic immigrants in non-Islamic countries, further complicating their ability to participate in these activities (Nicaise & Kahan, 2013).

Considering the relationship between religious traditions and prosocial behaviors among college-attending mothers (Barry et al., 2012; Wittek & Bekkers, 2015), it becomes evident that their religious beliefs and practices can provide a foundation for their caregiving roles and a sense of communal support (Pastorelli et al., 2015; Sherkat, 2015). These aspects can shape their experiences, decision-making processes, and overall well-being as they navigate the challenges of balancing motherhood and educational pursuits (Doorley et al., 2023).

For instance, specific religious communities like the Amish and Hutterite prioritize the needs of the group over individual needs, setting expectations for caregivers and mothers. Women in these communities play an outsized role in childcare and are significantly associated with the group’s economic survival (Editors of Encyclopedia Britannica, 2024). Similarly, within the ultra-Orthodox Hasidic Jewish community, women are taught to prioritize family and communal duties over personal ambitions or careers. Women participating in this religious tradition may have limited access to education and leadership positions (Adini et al., 2022; Biard, 2021; Sartori & Rosenbaum, 2021). However, women in religious communities often
have more autonomy and agency due to networks of female relatives and friends who provide support and empowerment (Khamis, 2024; Vidūnaitė, 2023). Additionally, Setyawati et al. (2024) reveal that within these communities, family caregiving is not only regarded as a divine gift but also as a crucial religious and cultural duty in Islam. By fostering knowledge sharing, emotional support, and practical assistance, these networks play a vital role in enhancing the well-being and empowerment of women within their collective cultural and social contexts (Schulz et al., 2020). In Hinduism, motherhood is considered sacred, with women expected to prioritize their children and family over their individual desires, embodying the divine motherly energy known as Shakti (Priyadharshini & Shantichitra, 2024). In other words, college-attending mothers who identify with collectivist religious communities may prioritize community and family responsibilities over personal activities while feeling connected to the well-being of their community (Germani et al., 2021; Priyadharshini & Shantichitra, 2024).

**Religious Tradition at Brigham Young University**

American society has evolved significantly with religion playing a key role, and educational institutions like BYU have been central to this development. Owned by the Church and located in Provo, Utah, BYU educates approximately 36,500 students (CollegeFactual.com, 2023). Additionally, BYU-Pathway Worldwide supports over 61,000 students globally from more than 180 countries as of 2022 (BYU-Pathway Worldwide, 2022a). Over 98% of BYU’s students identify with the Church, while a smaller group, about 430, come from diverse religious backgrounds or are non-religious (Eyre, 2019).

The Church offers both a collective identity as members of a global church and individual identities as residents in their respective countries and cities (The Church, 2015). This collective identity stems from affiliation with the Church and its shared beliefs, doctrines, and practices.
Meanwhile, members of the Church shape their individual identities based on various factors, including their unique cultural customs, traditions, and backgrounds, all while adhering to the universal teachings of Jesus Christ, as taught within the Church (Dollahite et al., 2017; The Church, 2015).

Religious tradition at BYU clearly defines roles and expectations for men and women. According to official materials from the Church (1995), such as The Family: A Proclamation to the World, fathers are tasked with presiding over their families with love and righteousness, providing for their basic needs, and ensuring their protection. Mothers are primarily responsible for nurturing and caring for their children (p. 102). These roles are seen as sacred responsibilities, and fathers and mothers are encouraged to work together as equal partners to fulfill them (Ballard, 2013).

It is essential to consider the distinctive contributions of both parents to elucidate the pivotal role of family dynamics and support systems in the lives of female college students with children, particularly in relation to their ability to exercise regularly and enhance their quality of life. Erickson (2018) highlights the Church’s unique nurturing style of fathers that complements that of mothers, leading to positive outcomes such as empathy, happiness, and strong relationships. Fathers’ interactions with their children encourage openness, exploration, and problem-solving abilities, which foster risk-taking and independence. They also play a crucial role in children’s brain development and are associated with their academic success (Erickson, 2018; U.S. Department of Health & Human Services, 2023). Additionally, the active participation of fathers can ease childcare responsibilities and provide emotional support, facilitating these college-attending mothers with children in maintaining regular exercise and improving their quality of life (Hulen, 2022).
Reinforcing this principle, President Russell M. Nelson (2008) proclaimed that “In God’s eternal plan, salvation is an individual matter; exaltation is a family matter” (Ancestors section, para. 6). Thus, the restored gospel of Jesus Christ, along with the inspired family proclamation, plays a pivotal role in guiding mortal preparation for exaltation, underscoring the central role of the family in achieving the highest realms of spiritual development, both individually and collectively (Bednar, 2022).

**Adverse Effects of a Lack of Exercise**

The transition into motherhood represents a complex and demanding process that encompasses various aspects, including hormonal changes, social adjustments, shifts in body image perception, and alterations in sleep patterns (Mughal et al., 2022). One significant concern during this phase is postpartum depression, which can have profound implications for both the mother and her child (Charrois et al., 2020). Regrettably, depression following childbirth is prevalent, with young mothers particularly susceptible to its occurrence (Charrois et al., 2020; Stanton et al., 2014). Furthermore, a lack of PA among college-attending mothers is associated with postpartum obesity, which in turn is linked to an increased risk of depression and other health complications (Stanton et al., 2014).

Neglecting PA can have far-reaching consequences beyond the individual’s well-being. It can be associated with poor nutrition, hinder educational pursuits, and impede economic stability, potentially resulting in long-term welfare losses across generations (Kaiser Family Foundation, 2022).

**Effects on Mental Health**

Depression is a significant global health challenge, affecting over 300 million people worldwide (Smith, 2014). The World Health Organization (WHO) has identified it as the

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primary contributor to global disability (Smith, 2014), mainly due to its close association with an increased suicide risk (Chin et al., 2022). Recent data released by the U.S. Department and Global Health from a 2020 national survey showed that Utah had the highest reported rate of any mental illness in the country, with nearly one in three Utah residents reporting experiencing a mental illness in the past year, amounting to a rate of 29.68% (Kaiser Family Foundation, 2022). More than one in ten Utahns reported a major depressive episode in the last year, characterized by feelings of hopelessness or a lack of pleasure lasting 2 weeks or longer (National Survey on Drug Use and Health [NSDUH], 2021). Since the onset of COVID-19, mental health issues have increased among postpartum women, with 41% reporting depression and 72% reporting moderate-to-high anxiety (compared to 15% and 29% pre-pandemic; Davenport et al., 2020). The National Institute for Health and Care Excellence (2014) stated that maternal mental health conditions can compromise a mother’s ability to provide sensitive and responsive care to their children, which can have long-term implications for their health and development (Howard & Khalifeh, 2020). Several studies have demonstrated the relationship between maternal mental health and child outcomes. For example, Charrois et al. (2020) found that maternal depression was associated with a higher risk of child emotional and behavioral problems and impaired cognitive development. Another study by Letourneau et al. (2012) found that maternal depression was associated with an increased risk of childhood internalizing and externalizing behaviors, impaired social competence, and academic achievement. These long-term implications can persist well into adolescence and adulthood. For instance, a study by Marcal (2021) found that children of depressed mothers had a higher risk of developing depression themselves in adolescence and adulthood. Similarly, a study by Murray et al. (2011) found that maternal depression was associated with an increased risk of offspring depression and anxiety in
adulthood. Maternal mental health conditions can have long-term implications for child outcomes, including emotional and behavioral problems, impaired cognitive and social development, and an increased risk of mental health issues in adolescence and adulthood (Letourneau et al., 2012; Marcal, 2021). Additionally, life stress, including depression, has been shown to be associated with adverse weight status in women (Stanton et al., 2014).

**Effects on Physical Health**

The childbearing years are a crucial life stage for women that can result in substantial weight gain, potentially leading to the development of obesity (Lim et al., 2022). Research has shown that postpartum obesity is a common problem among new mothers, with obesity rates ranging from 7% to 25% (Devlieger et al., 2016). Additionally, research suggests that a lack of PA is one of the significant contributors to postpartum obesity (Cochrum, 2015). Raspovic et al. (2023) found that a lack of PA was associated with higher body mass index (BMI) and obesity among postnatal mothers.

A lack of PA can have long-term consequences for college-attending mothers beyond postpartum obesity. The complications of obesity are profound and can potentiate decreased PA and sedentary behaviors, contributing to a “never-ending” spiral of obesity (Thorp et al., 2011). Studies have shown that individuals who are obese tend to spend more time in sedentary behaviors than their non-obese counterparts (Buman et al., 2010). Being overweight or obese can increase the risk of many health problems, including chronic diseases such as type 2 diabetes, high blood pressure, cardiovascular disease, stroke, joint problems, liver disease, gallstones, some types of cancer, and sleep and breathing problems, among other conditions (Williams et al., 2015). A global study found that those who did not engage in PA had significantly higher rates of depression, obesity, and chronic diseases than those who exercised regularly (Anderson &
Durstine, 2019), which can have significant health consequences for both the mother and child (Letourneau et al., 2012; Marcal, 2021).

**Economic and Social Effects**

According to a study by Santos et al. (2018), physical inactivity among mothers is associated with higher healthcare costs and lost productivity. Moreover, mental health issues can substantially relate to academic achievement, potentially hindering a mother’s ability to complete her education and attain financial stability (Grigoriadis et al., 2017). The relationship between depression and the experiences of college-attending mothers is significantly correlated with their motivation and productivity, while also leading to higher healthcare costs associated with treatment and hospitalization (Gelaye et al., 2016; Grigoriadis et al., 2017).

Postpartum depression is a prevalent mental health issue that occurs after childbirth and is significantly related to a mother’s mental health and well-being (Gelaye et al., 2016). According to the American College of Obstetricians and Gynecologists (2018), postpartum depression affects approximately one in seven women and can cause symptoms such as sadness, anxiety, and irritability. Postpartum depression also heightens the risk of suicide (Gelaye et al., 2016). Yu et al. (2024) found that women with postpartum depression were more likely to have suicidal thoughts and behaviors than women without postpartum depression. This increased risk of suicide can have “catastrophic consequences” for postnatal mothers and their families (Grigoriadis et al., 2017, p.34). Moreover, postpartum depression and suicide are significantly related to the welfare system through increased healthcare costs associated with mental health treatment, potentially increasing the need for social services and financial support for surviving family members (Grigoriadis et al., 2017). The relationship between health issues such as postpartum depression and obesity with healthcare costs and the welfare system highlights the
need for a better understanding of the challenges faced by college-attending mothers in maintaining their physical and mental health (Fotso et al., 2023).

Furthermore, obesity is linked to increased healthcare expenses and a higher likelihood of developing chronic conditions such as diabetes and heart disease. Such health problems can lead to more frequent use of medical services and medications, thereby increasing the costs for individuals and the welfare programs that aid them (Bleich et al., 2012). For instance, the increased healthcare costs associated with obesity and chronic diseases can strain Medicaid and other healthcare programs. Similarly, mental health issues can require additional support from social services programs, potentially increasing the demand for these resources (Gavin et al., 2010). Thus, addressing the lack of PA among college-attending mothers could have important implications for the well-being of individuals and the welfare system.

Benefits of Exercise

Promoting regular PA among college-attending mothers is not merely a matter of personal health; it is a critical intervention that can lead to profound benefits across physical and mental health domains, thereby contributing to societal well-being. This study seeks to elucidate and justify the comprehensive benefits of exercise for this demographic, highlighting the potential to improve quality of life, reduce healthcare burdens, and foster positive generational health habits.

**Individual Health Benefits**

Regular exercise is a critical health challenge faced by college-attending mothers, offering a wide spectrum of benefits that span physical and mental well-being. Physically, it addresses concerns such as postpartum obesity by aiding in effective weight management and plays an instrumental role in lowering the risk of chronic diseases like cardiovascular disease,
type 2 diabetes, and certain cancers (Physical Activity Guidelines Advisory Committee, 2018; Piccinini-Vallis et al., n.d.). The significance of maintaining an active lifestyle extends beyond physical health, as it is closely associated with mental health improvements such as enhanced body image and self-esteem and provides a natural outlet for stress relief. These aspects are particularly crucial for mothers navigating the physical and psychological transitions post-pregnancy, alongside the demands of academic pursuits and family responsibilities (Fotso et al., 2023; Lindwall et al., 2013).

Additionally, regular exercise boosts cognitive functions, including attention and memory, which are essential for effectively juggling the complex roles of student and parent (Arida & Teixeira-Machado, 2021). Together, these benefits underscore the importance of regular PA for maintaining physical health and as a foundational pillar supporting the comprehensive well-being of this group.

**Family Health Benefits**

Regular PA by mothers not only boosts their own health but also significantly affects family dynamics and marital quality positively. Research by Monteiro et al. (2013) shows that when mothers increase their levels of physical activity, the health benefits extend to their partners and children, promoting a healthier family environment. Additionally, Robles et al. (2014) highlight that engaging in PA together strengthens marital bonds and enhances overall health outcomes, suggesting that shared exercise routines and a commitment to a nutritious diet are integral to improving emotional support, reducing stress, and fostering a collective commitment to healthy living within the family.

Arevalo et al. (2023) found that children often inspire and motivate their mothers to engage in exercise, highlighting the reciprocal benefits of PA within the family unit. These
mothers not only participate in recreational activities with their children but also aim to be role models, promoting a lifestyle of health and longevity. The engagement in shared activities, as reported by participants in the Home-Based Intervention (HBI) group, has been shown to strengthen the mother-child bond, with mothers noting significant motivational support when engaging in PA with their children (Arevalo et al., 2023; Monteiro et al., 2013).

Thus, incorporating PA into family and marital routines provides valuable opportunities for couples and families to support each other’s health objectives (Robles et al., 2014). This approach is consistent with Robles’s findings, which underscore the advantages of strong marital connections for health (Robles, 2014). This extensive research emphasizes the broad benefits of PA, which not only enhance individual health but also improve marital and familial well-being (Arevalo et al., 2023; Monteiro et al., 2013; Robles, 2014; Robles et al., 2014).

**Societal Benefits**

Promoting PA among college students offers substantial societal benefits. Participating in PA can enhance social connections through group exercises (Mascarenhas et al., 2018), offering essential support for individuals who might otherwise feel isolated (Barney & Leavitt, 2021). This is particularly valuable in creating a supportive community environment that benefits everyone, especially those balancing multiple responsibilities like studying and caregiving.

Additionally, by reducing the prevalence of chronic diseases (Arida & Teixeira-Machado, 2021), regular exercise can alleviate the burden on healthcare systems and is associated with a more productive workforce (Søvold et al., 2021). Perhaps most importantly, promoting PA in this group sets a positive example for the next generations (Arevalo et al., 2023; Hulen, 2022), encouraging healthy lifestyle habits that can lead to long-term improvements in public health (Hoffmann et al., 2021; Lloyd et al., 2014).
Self-Determination Theory

SDT is an empirically supported theory and a widely recognized psychological framework that highlights the factors influencing individuals’ self-motivation and engagement in PA (Ryan & Deci, 2000, 2017). According to SDT, individuals are more likely to be intrinsically motivated and actively participate in PA when they experience a sense of autonomy, competence, and relatedness (Ryan & Deci, 2000). This theory has been extensively studied and provides valuable insights into understanding the underlying psychological mechanisms driving people’s involvement in PA. The theory distinguishes intrinsic and extrinsic motivations for PA and addresses their nature, determinants, and consequences (Ryan & Deci, 2017). According to SDT, social factors such as social support are associated with exercise intensity and adherence (Ryan & Deci, 2000).

Intrinsic motivation, the spontaneous tendency to seek novelty, challenges, and personal growth, is significant in driving individuals to engage in PA or activities (Deci & Ryan, 2000). It represents an internal drive that arises within individuals and is characterized by the inherent enjoyment, satisfaction, and excitement they experience while being active (Di Domenico & Ryan, 2017). College-attending mothers may demonstrate intrinsic motivation by finding pleasure in PA, utilizing their skills, feeling a sense of accomplishment, and deriving personal fulfillment from their progress.

According to SDT, PA is associated with happiness and subjective vitality, fulfilling psychological needs and boosting energy levels (Ryan & Frederick, 1997; Ryan et al., 2009). Understanding their motivation to engage in PA becomes crucial for college-attending mothers who navigate the demands of motherhood and academics. SDT posits that as autonomy increases, motivations become more self-determined and tend toward the intrinsic motivation
end of the continuum (Deci & Ryan, 2000). Self-determined motivations are linked to adaptive cognitive, affective, and behavioral responses, whereas non-self-determined motivations are associated with adverse outcomes (Deci & Ryan, 2000). Intrinsic motivation represents the highest level of self-regulation, driven by internal factors, while extrinsic motivation originates from external sources (Di Domenico & Ryan, 2017).

For college-attending mothers, fostering and nurturing intrinsic motivation can lead to sustained engagement in PA and relate to their overall well-being (Moreno-Murcia et al., 2013). They may exhibit intrinsic motivation by genuinely enjoying being active, seeking physical challenges, and finding personal fulfillment in their exercise progress. Regardless of external factors or outcomes, they value the benefits of PA to their physical and psychological well-being.

On the other hand, amotivation refers to a lack of perceived connection between engaging in PA and desired outcomes (Ryan & Deci, 2000). College-attending mothers experiencing amotivation may exhibit a lack of interest in fitness-related pursuits, indifference towards incorporating exercise into their routines, or perceiving exercise as a low priority compared to their other responsibilities. They may not perceive direct benefits or meaningful outcomes associated with PA, leading to a lack of motivation to engage in it (Teixeira et al., 2012).

Amotivation can be associated with various factors, including a lack of knowledge about the benefits of exercise, past negative experiences, or feeling overwhelmed by the demands of motherhood and academics. Addressing amotivation among college-attending mothers is crucial, as it can impede their adoption and maintenance of a physically active lifestyle. To address amotivation, interventions and support systems can focus on providing education about the positive effects of exercise on physical and mental well-being, offering enjoyable and accessible activity options, and addressing underlying barriers or challenges that relate to the lack of
motivation. Targeting amotivation makes it possible to help college-attending mothers develop a sense of autonomy, intrinsic motivation, and enjoyment towards PA, leading to improved overall health and well-being (Ryan & Deci, 2000; Teixeira et al., 2012).

Ryan and Deci (2017) introduced a taxonomy of extrinsic motivation that encompasses four subtypes: external regulation, introjected regulation, identified regulation, and integrated regulation. According to Wæge (2008), the concepts of internalization and integration play crucial roles in describing the various types of extrinsic motivation. Internalization refers to the process of adopting a value or regulation. At the same time, integration involves the individual fully assimilating the regulation into their own identity, emanating from their sense of self (Ryan & Deci, 2000).

External regulation is the most basic form of extrinsic motivation, where behavior is driven by external rewards or punishments (Ryan & Deci, 2017). For instance, a college-attending mother may be motivated to continue her education because she believes obtaining a degree will lead to better job prospects and financial stability for her family. In this case, the external reward is the expectation of improved career opportunities and increased income, which incentivize pursuing higher education (Ryan & Deci, 2017).

Introjected regulation involves performing a behavior to avoid guilt or shame or to enhance self-esteem (More & Phillips, 2021; Ryan & Deci, 2017). For instance, a college-attending mother may experience pressure to succeed academically to avoid feeling guilty about not meeting societal expectations or boost her self-esteem by demonstrating her capabilities as a mother and a student. This internal pressure drives her to perform well academically, driven by the desire to avoid negative emotions or enhance her self-worth in her roles (More & Phillips, 2021).
Identified regulation involves behaving in ways that align with personal conscience and values (Ryan & Deci, 2017). Behavior is considered essential and valuable, driven by personal choice and commitment rather than external rewards or pressure. For instance, a college-attending mother may choose to pursue higher education because she values the importance of education and wants to set a positive example for her children. She sees obtaining a degree to expand her knowledge, relate to her personal growth, and align with her values of lifelong learning (Ryan & Deci, 2017). In this case, the motivation to pursue education stems from an intrinsic desire to fulfill personal aspirations and create a meaningful relationship between her and her children’s lives.

The final stage of extrinsic motivation is called integrated regulation, representing the highest level of autonomy within this framework. Integrated regulation entails individuals fully incorporating behavior into their sense of self (Ryan et al., 2021). For example, a college-attending mother may fully integrate their pursuit of education into their identity, seeing it as an essential part of who they are. They may view their education aligning with their values of lifelong learning and self-improvement and find satisfaction and fulfillment in learning and growing intellectually.

Individuals may experience a combination of these motivations simultaneously. For example, a college-attending mother may initially be driven by external regulation (e.g., financial stability) but gradually internalize and integrate the pursuit of education into their identity as they progress in their academic journey.

Although categorized as extrinsic motivation, integrated regulation involves engaging in behavior not solely for its inherent enjoyment or satisfaction. Instead, it is driven by the alignment of the behavior with an individual’s values and identity, wherein intrinsic sources and
the desire for self-awareness guide their actions (Ryan et al., 2021). Extrinsic motivation is connected to potential rewards, such as motherhood, grades/degrees, appearance, or health maintenance.

Several studies provide strong empirical support for applying SDT to exercise motivation (Ng et al., 2012; Silva et al., 2010; Teixeira et al., 2012). For college-attending mothers, it is crucial to understand the factors that drive their motivation to engage in PA. Based on SDT, intrinsic motivation is the most effective long-term predictor of exercise adherence, which involves engaging in exercise for its inherent enjoyment or personal satisfaction. To enhance intrinsic motivation, college-attending mothers must fulfill their basic psychological needs for competence, autonomy, and relatedness (Deci & Ryan, 2000). Opportunities to develop exercise skills and knowledge can support feelings of competence, while providing choices and opportunities to make decisions about their exercise program can support autonomy. Social support from exercise partners or groups can fulfill the need for relatedness (Bernhart et al., 2022).

Research suggests that motivations for exercise among college-attending mothers may differ from their male counterparts or female college students without children, potentially due to the additional responsibilities and limited leisure time they face (Mattran et al., 2011). Studies have indicated that college-attending mothers may exhibit a greater inclination towards extrinsic factors, such as maintaining positive health, managing weight, and enhancing appearance, which is directly linked to their roles as caregivers and providers for their families (Connelly et al., 2015; Pykkonen, 2021). Furthermore, college-attending mothers may experience heightened social anxiety and perceive pressure from society and the media to attain specific body standards, particularly following pregnancy and while juggling caretaking responsibilities (Connelly et al.,
2015; Pykkonen, 2021). These external pressures can undermine their intrinsic motivation for exercise, leading to a shift towards more controlled forms of motivation, such as identified regulation, which involves aligning behaviors with personal values and goals (Deci & Ryan, 2000).

College-attending mothers may still be motivated by intrinsic factors such as enjoyment and challenge regarding exercise (Heintzman, 2022; Limbers et al., 2020). However, due to their demanding responsibilities and limited time, it may be necessary to prioritize these factors with the help of external support (Heintzman, 2022; Limbers et al., 2020). Additionally, societal expectations and the pressure to meet traditional gender roles may lead to prioritizing family obligations over personal health and fitness, creating barriers for college-attending mothers to exercise regularly (Limbers et al., 2020).

On the other hand, college-attending mothers may feel a heightened level of stress due to their multiple roles, which may lead them to prioritize exercise as a means of relaxation and stress relief (Heintzman, 2022; Limbers et al., 2020). Prioritizing exercise can benefit their overall well-being, as regular exercise has been shown to improve mental health and reduce stress levels (Limbers et al., 2020). Therefore, understanding the interplay between intrinsic and extrinsic factors, as well as the relationship between societal expectations and personal values, can help develop effective strategies for promoting exercise adherence among college-attending mothers.

**The Behavioral Regulation in Exercise Questionnaire-2**

BREQ-2, developed by Markland and Tobin (2004), is a robust and validated instrument designed to explore the multifaceted nature of individuals’ motivations towards PA. This 19-item questionnaire dissects motivation into five distinct subscales: external regulation, introjected
regulation, identified regulation, intrinsic motivation, and amotivation, each capturing a unique aspect of motivational regulation in exercise (Kovács & Kovács, 2021).

External regulation captures motivation driven by external pressures or rewards, while introjected regulation pertains to motivation steered by internal pressures, such as guilt or the desire to meet others’ expectations. Identified regulation reflects a more autonomous form of motivation, where exercise is valued for its outcomes, leading to a personal commitment to the activity (Kovács & Kovács, 2021). Intrinsic motivation, the most autonomous form, is characterized by exercising for the pure joy and satisfaction it brings. Amotivation, conversely, signifies a disconnect between exercise participation and the attainment of desired outcomes, highlighting a lack of motivation (Markland & Tobin, 2004).

Through its detailed subscales, the BREQ-2 aims to measure the spectrum of motivation from fully external to entirely intrinsic, providing insights into how individuals relate to exercise on a motivational level. With its strong psychometric properties, reliability (Kovács & Kovács, 2021), and validity, the BREQ-2 has become a critical tool for researchers and practitioners looking to understand the underlying motivational regulations that drive or deter individuals from engaging in PA. By assessing these various forms of motivation, the BREQ-2 provides valuable information about the degree of autonomy in exercise motivation and the correlation between external and internal factors on exercise behavior (Markland & Tobin, 2004).

**The Godin-Shephard Leisure-Time Physical Activity Questionnaire**

GSLTPAQ is a widely used self-report measure designed to assess an individual’s engagement in leisure-time PA (Godin, 2011; Motl et al., 2018). This questionnaire provides valuable insights into moderate and strenuous PA frequency and duration during a typical week.
Applying the GSLTPAQ to college-attending mothers allows researchers to assess their levels of engagement in leisure-time PA. College-attending mothers face unique challenges in managing their academic responsibilities and motherhood duties, which may relate to their ability to engage in regular PA (NCES, 2021; USGAO, 2021). By utilizing the GSLTPAQ, researchers can gain insights into the frequency and duration of moderate and strenuous PA within this population (USGAO, 2021).

The World Health Organization’s Five Well-Being Questionnaire

WHO-5 is a validated and reliable self-report tool used to assess overall well-being (Sischka et al., 2020; Topp et al., 2015). This questionnaire consists of five items that evaluate positive mood, vitality, and general interest experienced by individuals over the past two weeks (Topp et al., 2015).

Applying the WHO-5 questionnaire to college-attending mothers allows researchers to assess their overall well-being in terms of positive mood, vitality, and general interest. College-attending mothers face unique challenges as they balance the demands of academic pursuits and motherhood responsibilities. Evaluating their well-being provides valuable insights into the relationship between these factors and their overall quality of life (Sischka et al., 2020; Topp et al., 2015).

Definition of Terms

College-Attending Mothers / College Mothers / Female College Mothers

This study focuses on adult women aged 18 or older who are primary caregivers of at least one biological child. It relates to young mothers’ hormonal changes and experiences throughout the prenatal and postnatal periods while they are concurrently pursuing higher education in college.
Physical Activity / Regular Exercise

In this study, PA is defined as any bodily movement that engages the skeletal muscles and leads to a significant increase in energy expenditure compared to resting levels (Bouchard & Shephard, 1994, p. 77). According to the guidelines provided by the USDHHS (2018), adults are recommended to engage in at least 150 to 300 minutes (about 5 hours) per week of moderate-intensity aerobic PA or 75 to 150 minutes (about 2 and a half hours) of vigorous-intensity aerobic PA or equivalent combination of both (American College of Sports Medicine, 2019).

Well-Being / Quality of Life

This study utilizes the WHO-5 to assess overall mental wellness. The WHO-5 is a concise questionnaire consisting of five straightforward and non-intrusive questions that measure subjective well-being in individuals. It has been widely used as a screening tool for depression and as an outcome measure in clinical trials, demonstrating satisfactory validity across various fields of study (Sischka et al., 2020; Topp et al., 2015).
CHAPTER 3

Methods

This study investigated the experiences and motivations related to PA among female college students aged 18 and older, each with at least one biological child residing with them at least 50% of the time. It correlated this arrangement with young mothers’ hormonal changes and experiences during prenatal and postnatal periods. The research protocol received approval from the Institutional Review Board (IRB) at BYU (see Appendix A). Informed consent was secured from all participants before they engaged with the online questionnaire, ensuring their identities remained anonymous and their data confidential and secure throughout the study. This study was conducted according to the ethical standards outlined in the American Psychological Association (APA) Ethics Code and the requirements (American Psychological Association, 2020). The research was maintained free from any conflicts of interest.

Participants & Recruitment

The participant pool was drawn from the female student body at Brigham Young University, where over 98% of the student population, being members of the Church, commonly observe the Church’s health code, the Word of Wisdom (D&C 89:1–21). This health code is fundamental to the university’s Honor Code (Brigham Young University, n.d.), upheld across the Provo campus and in the online BYU-Pathway Worldwide program, which all students, regardless of their religious affiliation, agree to follow as a condition of their attendance (Brigham Young University, n.d.).

According to CollegeFactual.com (2023), the Provo campus has an enrollment of 18,293 female students, while BYU-Pathway Worldwide reports approximately 32,751 female students, as the Statistics & Facts, 2022 Annual Data. (BYU-Pathway Worldwide, 2022b).
Out of the pool, over 1,500 female students participated in the online survey. Among these, 286 self-identified as mothers with at least one biological child living with them for more than 50% of the time. Participants were thoroughly briefed on the study’s procedures, emphasizing the voluntary nature of their participation. They were informed of their right to decline participation or withdraw from the study at any point without facing any adverse consequences. A total of \((n = 264)\) participants successfully completed most of the survey questions relevant to the study.

Recruitment was multifaceted, beginning with a digital campaign that involved sending nearly five thousand emails through various university-associated channels. These channels included the BYU-Pathway Worldwide Research Team, and the College of Physical and Mathematical Sciences newsletter.

The effort was complemented by a ground campaign at the Provo campus, where over 2,500 flyers were distributed and posters with QR codes for the survey were prominently displayed, notably at the Women’s Services and Resources Center and across campus facilities.

The study also leveraged the extensive reach of social media, utilizing platforms like Facebook, Instagram, and LinkedIn, thus ensuring comprehensive coverage and convenience for participants. We chose a survey methodology to quantitatively capture trends, attitudes, and opinions within a representative sample, aligning with Fowler’s (2009) guidance on survey research practices. Prospective participants identified through these varied channels were invited to anonymously complete a 36-item questionnaire via Qualtrics, which upheld privacy and maximized the efficacy of our recruitment strategy.
Instruments

This survey study utilized a quantitative approach to explore the PA behaviors, motivational regulations, and overall well-being of college-attending mothers. Utilizing both demographic information and three validated self-report questionnaires (see Appendix B) the study assessed participants’ physical activity levels using GSLTPAQ, examined their exercise motivations with BREQ-2, and measured their well-being using WHO-5.

Demographics

The demographic section of our survey consisted of nine questions (age, number of children, etc.). These questions helped to understand the participant-backgrounds and how these might relate to their PA behaviors, motivational regulations, and overall well-being.

Gender Identity. Participants were asked to identify their gender, with options including Male, Female, and Prefer not to say. The selection of “Male” terminated the survey to maintain the focus on female and other gender identities relevant to the study’s scope.

Age. Age brackets were provided to classify participants: 18–25, 26–30, 31–40, 41–50, and 51+ years.

Marital Status. This question aimed to identify participants’ marital status, offering options such as Single (never married), Married, Divorced, Widowed, and Separated.

Number of Biological Children. Participants were asked about the number of biological children residing with them at least 50% of the time. Response options were 0, 1, 2, 3, or 4+. Selecting ‘0’ indicates no caregiving responsibilities, with a selection of “0” redirecting participants to question 5, focusing the survey on those with caregiving responsibilities.

Age Range of Children. To further understand the family dynamics, participants were asked about the age range of their children: 0–6, 7–12, 13–17, and 18+ years.
**Occupation.** The survey sought to understand the participants’ occupational status concerning their student status, with categories including combinations of full-time/part-time students and employment statuses.

**Ethnicity.** Participants were given options to self-identify their ethnicity, including American Indian or Alaska Native, Asian, Black or African American, Caucasian, Hispanic, and Pacific Islander—this question aimed to assess the diversity within the sample.

**Current Residency.** Participants were asked about their current residency to capture the geographical diversity and living arrangements, with options tailored to the context of BYU and its Pathway Worldwide program.

**College Year Classification.** Participants indicated academic progress by selecting their current college year: Freshman, Sophomore, Junior, Senior, or Graduate Student.

By incorporating these demographic questions, the survey aimed to establish a detailed understanding of the participant backgrounds, providing a robust foundation for analyzing the collected data in relation to their PA and well-being.

**Godin-Shephard Leisure-Time Physical Activity Questionnaire**

The GSLTPAQ is a valid and reliable (Godin, 2011; Motl et al., 2018) self-report questionnaire used to assess an individual’s leisure-time PA. It consists of three items that evaluate the frequency and duration of Walking, Moderate, and Vigorous PA in a typical week. Participants are asked to estimate their PA levels over the past month.

The GSLTPAQ was employed to evaluate the frequency of leisure-time physical activities, specifically those lasting at least 15 minutes during an average week. This scoring system classifies individuals into three PA categories: insufficiently active (Health Contribution Score [HCS] < 14 units, translating to < 7 kcal/kg/week), moderately active (HCS between 14
and 23 units, equivalent to 7 to 13.9 kcal/kg/week), and active (HCS ≥ 24 units, surpassing 13.9 kcal/kg/week; Motl et al., 2018).

A GSLTPAQ Index (Godin Index) score is obtained by adding up the units of moderate and strenuous PA, with 24 or more units indicating an active lifestyle with substantial benefits, 14 to 23 units indicating moderate activity with some benefits, and less than 14 units indicating insufficient PA with low benefits (Godin, 2011; Motl et al., 2018). These index scores were used for all subsequent analyses.

**Behavioral Regulation in Exercise Questionnaire-2**

The BREQ-2 is a valid and reliable (Kovács & Kovács, 2021; Markland & Tobin, 2004) 19-item, 5-subscale questionnaire that measures an individual’s motivational regulations toward exercise designed to assess the degree of autonomous motivation, including: (a) External regulation (e.g., “I am coerced to do this activity or for a reward”), (b) Introjected regulation (e.g., “I do this activity because I would feel guilty or pressure due to others’ expectations of me”), (c) Identified regulation (e.g., “I do this activity because I relate to or desire the outcomes”), (d) Intrinsic motivation (e.g., “I do this behavior for the reason that emanates from within the self or the activity”), and © Amotivation (e.g., “I do not see any contingency for my participation to outcomes I desire”). Each subscale contains four items except introjected regulation, which contains three items. Participants respond to each item on a 5-point Likert-type scale ranging from 0 = Not true for me; 1 = Barely true for me; 2 = Moderately true for me; 3 = Mostly true for me; to 4 = Very true for me. Therefore, a neutral score (neither agree nor disagree) = 2. Total scores for each subscale were computed using where an average score was computed based on its three items and was used for all subsequent analyses. A self-determination
index (SD Index) score, an indication of one’s relative autonomy vs-controlled motivation, was calculated using the following formula \( (3*IM+2-3*IM+2*IDR-2*ER-3*AM) \).

**World Health Organization’s Five Well-Being Questionnaire**

The WHO-5 is a validated and reliable self-report tool designed to evaluate an individual’s overall well-being (Sischka et al., 2020; Topp et al., 2015). It comprises five positively worded items that assess (a) Positive Mood (e.g., “I have felt cheerful and in good spirits” and “I have felt calm and relaxed”), (b) Vitality (e.g., “I have felt active and vigorous” and “I woke up feeling fresh and rested”), and (c) General Interest (e.g., “My daily life has been filled with things that interest me”), experienced over the past two weeks (Sischka et al., 2020). Participants provide ratings for each item on a 6-point Likert-type scale, ranging from 0 (at no the time) to 5 (all of the time). The raw score spans a range of 0 to 25, with 0 representing the most unfavorable quality of life and 25 representing the most favorable. To derive a percentage score that ranges from 0 to 100, the raw score is multiplied by a factor of 4 to serve as a well-being index (WB Index) score and was used for all subsequent analyses. A percentage score of 0 indicates the lowest attainable quality of life, while a score of 100 signifies the highest possible quality of life (Topp et al., 2015).

**Data Collection**

This study employs a cross-sectional survey (via Qualtrics) design, integrating a concise, 10-minute questionnaire comprised of 36-items, structured into four distinct sections: (a) demographic information, capturing essential details such as age, gender, marital status, ethnicity, and educational level; (b) current PA levels, assessed using the GSLTPAQ; (c) motivational indices related to self-determination, measured via the BREQ-2; and (d) indices of well-being and quality of life, evaluated using the WHO-5. Including these sections allows for a
comprehensive examination of participants’ PA behaviors, motivational factors, and overall well-being.

**Data Analysis**

Data for the study were analyzed using IBM Corp.’s Statistical Package for the Social Sciences (SPSS version 29) to examine the nature of and the relationship between the motivation toward PA, level of PA, and well-being among college-attending mothers. Data reduction techniques were applied, where composite scores for the five BREQ-2 subscales were derived by averaging items within each subscale for analysis. The reliability of these subscales was assessed using Cronbach’s Alpha to ensure internal consistency.

Computing responses from the GSLTPAQ and WHO-5 scales established activity and well-being index scores, respectively. Descriptive statistics were examined to understand participant motivational regulation, PA, and quality of life. Additionally, the SDI score was calculated using the BREQ-2 Relative Autonomy Index (RAI) formula. This formula integrates various motivational components to quantify the overall autonomy in participants’ motivation.

The core analysis examining the (a) means and standard deviations of indices of motivation, PA and well-being, and (b) the relationships between self-determination, PA, and well-being.

Pearson Correlation analysis was used to determine (a) the existence of the proposed SDT simplex pattern (Guay, 2022) and (b) the strength and direction of variables of interest.
CHAPTER 4

Results

The analysis of survey data focused on the demographic characteristics, PA behaviors, motivational regulations, and overall well-being of participants. Descriptive statistics in this chapter offered insights into the distribution and central tendencies of these variables, revealing patterns and tendencies within this specific demographic group.

Demographic Analysis

The descriptive statistics provide a nuanced examination of the demographic profile of the college-attending mothers participating in this research, underscoring key aspects such as age distribution, marital status, the number of children, and academic level. Notably, Table 1 shows that a significant percentage of mothers, 40.9%, fall within the 18 to 30 age brackets, and 34.1% are in their thirties. The majority, 79.5%, are married, while 20.5% are single mothers without a partner’s daily support. Furthermore, 63.2% of these mothers have one or two children, indicating a predominant presence of younger families. These younger mothers, particularly those in their freshman year who account for nearly half of the sample at 44.7%, are at a crucial intersection of their parenting and academic pathways. Conversely, 26.5% of participants engaged in graduate studies face a different set of challenges, potentially dealing with the increased pressures that come with more advanced academic pursuits.
Table 1

Sample Demographic Frequencies

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>65</td>
<td>24.6</td>
</tr>
<tr>
<td>25–30</td>
<td>43</td>
<td>16.3</td>
</tr>
<tr>
<td>31–40</td>
<td>90</td>
<td>34.1</td>
</tr>
<tr>
<td>41–50</td>
<td>44</td>
<td>16.7</td>
</tr>
<tr>
<td>51+</td>
<td>22</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>264</td>
<td>100</td>
</tr>
<tr>
<td><strong>Marital Status (MS)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-never Married</td>
<td>28</td>
<td>10.6</td>
</tr>
<tr>
<td>Married</td>
<td>210</td>
<td>79.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>Widowed</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>Separated</td>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>(Missing Data)</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>264</td>
<td>100</td>
</tr>
<tr>
<td><strong>Number of Children (NC)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>97</td>
<td>36.7</td>
</tr>
<tr>
<td>2</td>
<td>79</td>
<td>29.9</td>
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<tr>
<td>3</td>
<td>45</td>
<td>17.0</td>
</tr>
<tr>
<td>4+</td>
<td>43</td>
<td>16.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>264</td>
<td>100</td>
</tr>
<tr>
<td><strong>Year in School (Year)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshmen Year</td>
<td>118</td>
<td>44.7</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>14</td>
<td>5.3</td>
</tr>
<tr>
<td>Junior Year</td>
<td>24</td>
<td>9.1</td>
</tr>
<tr>
<td>Senior Year</td>
<td>36</td>
<td>13.6</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>70</td>
<td>26.5</td>
</tr>
<tr>
<td>(Missing Data)</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>262</td>
<td>99.2</td>
</tr>
</tbody>
</table>

*Note.* Categories: Divorced, widowed, and separated indicate that college-attending mothers without a daily support partner.
Physical Activity Analysis via GSLTPAQ

For college-attending mothers from BYU, their PA scores were derived from data obtained through GSLTPAQ. Strenuous or vigorous activities were assigned a score of 30.6 (3.4 hours per week), calculated by multiplying the activity frequency by nine. Moderate activities were scored at 18.5 (3.7 hours per week), calculated by multiplying their frequency by five. Although walking and mild activities were included in the total activities, they were not factored into the HCS. Thus, the combined score for vigorous and moderate activities totaled 49.1, placing the group in the ‘active’ category according to HCS criteria. This indicates a high level of PA aligning significantly with health recommendations from global and American health authorities (Motl et al., 2018).

The Godin (PA) Index [GI], displayed in Figure 1 shows a mean score of 65.34 (SD = 40.78). This indicates that participants were generally active in their physical pursuits.

Figure 1

Godin-Shephard Leisure-Time PA Index Among College-Attending Mothers at BYU
Motivational Regulations Analysis via BREQ-2

Scale reliability was established via Cronbach’s $\alpha$ in Table 2, including Motivation, Self-Determination Index [SDI], GI, and Well-being Index Scores [WBI], along with corresponding Standard Deviations and Cronbach’s Alpha Scores with all reliability scores $\geq 0.7$ (Wadkar et al., 2016). Utilizing the BREQ-2 scale to gauge motivational regulations provided nuanced insights into participants’ exercise motivations, as delineated in Table 2. The motivational indices revealed that: (a) participants displayed modestly higher intrinsic motivation than not (Intrinsic Motivation [IM]; $M = 2.64$, $SD = 1.10$), and (Identified Regulation [IDR]; $M = 2.93$, $SD = 0.94$); (b) they were less controlled in their motivations (Introjected Regulation [IJR]; $M = 1.84$, $SD = 1.14$), and (External Regulation [ER]; $M = 0.91$, $SD = 0.94$); and (c) they experienced low levels of (Amotivation [AM]; $M = 0.59$, $SD = 0.86$).

Table 2

Motivation, Self-Determination Index, Godin (PA) Index, and Well-Being Index Scores, Standard Deviations, and Cronbach’s Alpha Scores

<table>
<thead>
<tr>
<th>SDT Subscale Scores</th>
<th>$N$</th>
<th>$Mean$</th>
<th>$SD$</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>258</td>
<td>2.64</td>
<td>1.10</td>
<td>0.88</td>
</tr>
<tr>
<td>IDR</td>
<td>263</td>
<td>2.93</td>
<td>0.94</td>
<td>0.79</td>
</tr>
<tr>
<td>IJR</td>
<td>253</td>
<td>1.84</td>
<td>1.14</td>
<td>0.78</td>
</tr>
<tr>
<td>ER</td>
<td>224</td>
<td>0.91</td>
<td>0.94</td>
<td>0.84</td>
</tr>
<tr>
<td>AM</td>
<td>201</td>
<td>0.59</td>
<td>0.86</td>
<td>0.87</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Index Scores</th>
<th>$N$</th>
<th>$Mean$</th>
<th>$SD$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SDI</td>
<td>263</td>
<td>2.13</td>
<td>1.85</td>
<td>--</td>
</tr>
<tr>
<td>GI</td>
<td>211</td>
<td>65.3</td>
<td>40.78</td>
<td>--</td>
</tr>
<tr>
<td>WBI</td>
<td>262</td>
<td>61.7</td>
<td>24.13</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. SDI score was calculated using BREQ-2 Relative Autonomy Index (RAI) =

$3*IM+2*IDR-IJR-2*ER-3*AM$; GI score = $(9*Strenuous) + (5*Moderate) + (3*Walking)$;

WBI score = Raw Score*4.
The SDI scores ranged from -2.92 to 10, with a mean score of 2.13, as shown in Figure 2, indicating that participants were, on average, experiencing a degree of autonomous self-regulation in their motivational profiles and processes.

Figure 2

*Self-Determination Index Among College-Attending Mothers at BYU on the BREQ-2 Scale*

Well-Being Analysis via WHO-5

The WHO-5 WBI depicted in Figure 3 assesses participants’ perceived well-being. The index recorded a mean score of 61.65 (SD = 24.13), indicating that, on average, the well-being level in this sample leans towards the positive end of the spectrum. However, it’s noteworthy that 23% of the participants reported poor well-being (defined as a WHO-5 score ≤ 50), and 10.6% exhibited scores suggestive of depressive symptoms (WHO-5 score ≤ 28).
These average well-being scores are essential for the study as they may correlate with the participants’ PA levels and motivational profiles. High well-being scores might be associated with higher PA and a more intrinsic motivation to engage in such activities. Conversely, low well-being scores could reflect barriers to physical activity, possibly due to mental health challenges. Understanding these aspects is pivotal for developing interventions that not only support the physical health of college-attending mothers but also their mental and emotional well-being, contributing to their overall quality of life and academic success.

Correlation Analysis

The correlation analysis was conducted to delineate the relationships within SDT constructs—specifically, IM and various regulation types—and to investigate how these relate to
PA and overall well-being. This revealed a SDT simplex pattern, indicating significant positive and negative relationships between IM and IDR, and increasingly negative with measures of IJR, ER, and AM respectively (Table 2 and Table 3). The correlation matrix in Table 3 supported the SDT simplex pattern, confirming the predicted relationships by the theory regarding the proximity of motivational types on the continuum displayed a positive correlation \((r = .25)\), and significant but small positive correlation with well-being \((r = .40)\). Similarly, the association between PA and well-being was significant, small to moderate positive correlation \((r = .39)\).

Correlation analysis illuminated a SDT simplex pattern of intrinsic and identified motivation showing the more direct correlations, diverging as motivational constructs became less externally regulated. Finally, the SDI’s correlation with PA \((r = .25)\) and well-being \((r = .40)\) confirmed the hypothesized positive but low relationship between regular PA, self-determination, and enhanced quality of life for these college-attending mothers.
Table 3

Demographic, Subscale, and Index Correlations

<table>
<thead>
<tr>
<th>Self-Determination Subscale</th>
<th>Age</th>
<th>MS</th>
<th>NC</th>
<th>Year</th>
<th>IM</th>
<th>IDR</th>
<th>IJR</th>
<th>ER</th>
<th>AM</th>
<th>SDI</th>
<th>GI</th>
<th>WBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>.212**</td>
<td>.221**</td>
<td>-187*</td>
<td>-023</td>
<td>-073</td>
<td>-151*</td>
<td>-310**</td>
<td>.134</td>
<td>-131</td>
<td>-291**</td>
<td>.074</td>
</tr>
<tr>
<td>MS</td>
<td></td>
<td></td>
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<td>.020</td>
<td>.092</td>
<td>-043</td>
<td>-065</td>
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<td>.072</td>
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<td>.025</td>
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<tr>
<td>NC</td>
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<td>-181*</td>
<td></td>
<td></td>
<td>-.026</td>
<td>-085</td>
<td>-187*</td>
<td>-.131</td>
<td>.053</td>
<td>.012</td>
<td>-.111</td>
<td>.049</td>
</tr>
<tr>
<td>Year</td>
<td></td>
<td>.062</td>
<td>.119</td>
<td>.074</td>
<td>.188*</td>
<td>.044</td>
<td>-.016</td>
<td>.109</td>
<td>-.048</td>
<td></td>
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</tr>
<tr>
<td>IM</td>
<td>[.88]</td>
<td>[.734**</td>
<td>.307**</td>
<td>.004</td>
<td>-.220**</td>
<td>.748*</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDR</td>
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<td>.441**</td>
<td></td>
<td>.016</td>
<td>-.334**</td>
<td>.702**</td>
<td>.422**</td>
<td>.454**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IJR</td>
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<td></td>
<td>.337**</td>
<td></td>
<td>.039</td>
<td>-.005</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>ER</td>
<td>[.84]</td>
<td></td>
<td></td>
<td>.482**</td>
<td></td>
<td>-.513**</td>
<td>.170*</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>[.87]</td>
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<td></td>
<td></td>
<td>-.727**</td>
<td></td>
<td></td>
<td></td>
<td>.096</td>
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</tr>
</tbody>
</table>

Index Scores

| SDI |     |     |     |     |     |     |     |     |     |     |     |     |
| GI  |     |     |     |     |     |     |     |     |     |     |     |     |
| WBI |     |     |     |     |     |     |     |     |     |     |     |     |

Note. ** = p < .01; Cronbach’s Alphas are on Diagonal where applicable. SDI correlations (outlined in a box) support a simplex pattern where adjacent items are more highly and directly correlated while distal items are decreasing or indirectly correlated.
CHAPTER 5

Discussion

This chapter explores the relationships among PA, motivation, and well-being in the context of collegiate motherhood framed by SDT. Using GSLTPAQ, BREQ-2, and WHO-5 data, the study examines habitual PA, the correlation between motivational factors and PA, and overall well-being among college-attending mothers at BYU. The purpose is to illuminate the complex dynamics shaping PA behaviors and their relationship to quality of life. The hypothesis suggests that these mothers’ participation in regular PA is associated with a complex array of motivational dynamics and perceived obstacles correlated with BYU’s values. Despite inherent motivation, tangible constraints may relate to inconsistent activity levels. However, the university’s religious-cultural context may augment the significance of PA, aligning it with personal values and potentially fostering more consistent exercise habits, which are significantly related to their well-being.

Findings

In the findings from the study of college-attending mothers, the demographic analysis (Table 1) indicates a significant representation of young families, with the majority being married and parenting one or two children under age 6. Notably, around 75% younger mothers in their twenties and thirties, particularly those at the commencement of their college education, make up over one in five without a partner daily support, which may pose a unique set of challenges as they navigate the responsibilities of academics and parenting.

Physical Activities

The USDHHS (2018) advises adults to participate in weekly moderate-intensity PA for substantial health benefits. Despite this, the Spring 2019 report from the ACHA-NCHA II
(ACHA, 2019) shows a notable gender disparity, with female college students less likely to meet these PA guidelines than their male peers. This issue is exacerbated by the findings of Faro et al. (2019), who note the crucial benefits of PA for the psychological, physiological, and psychosocial well-being of female college students, many of whom do not meet the recommended 150 to 300 minutes (about 5 hours) of moderate-intensity or 75 to 150 minutes (about 2 and a half hours) of vigorous-intensity aerobic PA per week (ACSM, 2019; USDHHS, 2018). Ferrari et al. (2010) report that about 80% of U.S. women receive no guidance on PA in the first 3 months postpartum. Additionally, Carson et al. (2018) highlights that women with dependent children at home are significantly less likely to adhere to PA guidelines, indicating unique challenges faced by this group.

In contrast, the PA analysis conducted through the GSLTPAQ (Table 2) for this study shows that participants, predominantly from BYU, exhibit a high level of physical engagement (3.4 hours of vigorous activities and 3.7 hours of moderate activities per week), categorizing them as “active.” This suggests a strong commitment to health, surpassing that of the general collegiate female population nationwide. Despite balancing the challenges of academics and parenting, these college-attending mothers at BYU exceed the CDC recommendations and the Physical Activity Guidelines for Americans (USDHHS, 2018). This finding aligns with a recent report from the ACSM, which indicates that most female college students without such responsibilities do not meet these guidelines (ACSM, 2019; USDHHS, 2018). This higher engagement level may be attributed to (a) BYU’s health code, encapsulated in the Word of Wisdom, which advocates for a balanced lifestyle, including regular exercise (D&C 89:1–21; Brigham Young University, n.d.); and (b) the Church’s nurturing parenting style (Erickson, 2018) and (c) these mothers’ self-determination.
Motivation in Physical Activity

The BREQ-2 scale is specifically designed to assess autonomous motivation across a spectrum, from external incentives to internal satisfaction, providing insights into the factors correlated with an individual’s exercise behavior (Kovács & Kovács, 2021; Markland & Tobin, 2004). Analysis using the BREQ-2 indicates that college-attending mothers at BYU tend towards intrinsic and self-determined regulation. Moderate intrinsic motivation and significant self-determined regulation suggest that internalized values and personal goals were more correlated with their PA motivation than external pressures or rewards. Their motivation was characterized by lower levels of external regulation and reduced association with factors such as external coercion, reward, internal pressure, or guilt. SDI scores reveal that participants generally experienced a significant degree of autonomous self-regulation in their motivational profiles. This internal motivation, driven more by enjoyment, satisfaction, personal values, and desired outcomes than not. Combined with low levels of amotivation, suggests that these mothers were more likely to engage in PA due to self-determination rather than external compulsion.

Well-Being

The WHO-5 Well-Being Index pointed to a moderate level of overall well-being among the participants, offering insight into their overall well-being. More than half of the cohort scored above the midpoint on the WHO-5 scale, reflecting good well-being experienced over the past 2 weeks. Nevertheless, notable data revealed a significant 23% of participants had poor well-being, and 10.6% displayed depressive symptoms. These findings are consistent with broader trends, as highlighted by the (NSDUH, 2021) report, which noted that more than one in ten Utah residents experienced major depressive episodes in 2020, marked by extended periods of hopelessness.
Moreover, these results may be related to various stressors, including the demands of parenthood, marital dynamics, cultural differences, and many uncertainties in society. For Millennials (born 1980–1994) and Generation Z (born 1995–2009) college students, the primary concerns are financial insecurity, climate change, and healthcare, with education ranking fourth according to (Deloitte Global, 2021). These factors often intersect with systemic oppression, exacerbating the pressures on the participants and relating to their mental health and quality of life in the future.

For instance, during the 2020–2021 academic year, nearly one-third of the college students in the U.S. attributed their declining academic performance to ongoing issues with their emotional and mental well-being (Eisenberg et al., 2021). Additionally, *The State of Higher Education 2022 Report* by the Gallup and Lumina Foundation (2022) highlighted a significant rise in college students citing emotional stress as a reason for considering a temporary withdrawal from their studies. Specifically, the report noted that in 2021, 76% of bachelor’s degree students and 63% of associate degree students reported emotional stress as a factor, showing substantial increases from the previous year.

Addressing these mental health issues can enhance the well-being of college-attending parents and positively relates to their academic success and retention. Such strategic initiatives are essential for fostering a supportive educational environment that can effectively respond to the complex needs of today’s diverse students.

**Exploring Correlations: Physical Activity, Motivation, and Quality of Life**

SDT typically predicts that higher levels of PA would correlate with increased intrinsic motivation and well-being (Deci & Ryan, 2000, 2012; Granero-Jiménez et al., 2022; Ryan & Deci, 2017). However, the observed significant and positive, but low, correlations suggest that
various factors within this unique group might correlate with the expected SDT relationships differently. Specifically, the SDI exhibited a positive, albeit low, correlation with PA ($r = .249$) and well-being ($r = .402$). The association between PA and well-being showed a significant, small to moderate positive correlation ($r = .394$). Several factors may explain this phenomenon:

**Time Constraints.** College-attending mothers often struggle with extremely limited personal time, which directly affects their ability to engage in PA. An Opinium poll revealed that nearly one-third of these mothers have less than an hour of personal time daily (Sport England, 2019). This scarcity of time can make scheduling any form of PA feel more like a necessity than an enjoyable activity, often resulting in lower levels of intrinsic motivation and overall enjoyment.

The survey data, with an average completion time of 10 minutes but ranging from 2 minutes to over 5 days, underscores the significant variability in their daily schedules. This suggests that those under greater time pressures may engage in PA without genuine interest, which could negatively relate to the motivational quality and benefits of their PA.

**Multiple Roles.** These mothers often juggle multiple responsibilities, including academic obligations, parenting, and possibly part-time or full-time work. With such packed schedules, finding time for PA can feel like just another task on a long to-do list rather than a welcome break or a chance for personal time. The combination of academic work and parenting creates a high-stress environment for these mothers, potentially leading to physical and mental fatigue. This fatigue can make scheduled exercise seem less appealing, viewing it as another demand rather than a rejuvenating break. Furthermore, over 33% of the participants reported experiencing poor well-being, with some displaying depressive symptoms. This state of poor
mental health can further diminish the appeal and perceived benefits of PA, weakening the potential positive relationship to their overall well-being and thereby reducing the correlation.

**Lack of Support.** The absence of adequate support both at home and at work can relate to the feasibility and enjoyment of engaging in PA. Over one in five college-attending mothers are single or lack a partner to support them, so managing time for exercise becomes more challenging and can seem like an additional burden. Therefore, it may affect both intrinsic motivation increases and perceived well-being.

**Cultural and Socioeconomic Factors.** Cultural and socioeconomic factors significantly related to attitudes toward PA and self-care. The diverse ethnic backgrounds and varying residency statuses of students from BYU and BYU-Pathway Worldwide, whether local or international, relate to both perceptions and benefits of PA. Factors such as cultural norms around clothing (Aljehani et al., 2022), body image (Rodgers et al., 2024), and exercising in public spaces play critical roles in shaping these attitudes (Hwang et al., 2022; Pykkonen, 2021; Rodgers et al., 2024).

**Perfectionism and Obligations.** Perfectionism is a common trait among members of this demographic (Allen & Wang, 2014). This characteristic often drives individuals to set excessively high standards for themselves, including their PA levels. This internalized pressure can turn PA into a source of stress rather than relief (Peer & McGraw, 2017), as individuals may engage in PA not only to meet health standards but also to align with personal, possibly unattainable standards of perfection. Quantitative research indicates that devout members of the Church tend to focus on self- and other-oriented perfectionism rather than socially prescribed perfectionism, suggesting that they are more intrinsically motivated to adhere to strict standards (Crosby et al., 2011).
Moreover, perceiving PA as an obligation rather than a choice can reduce its intrinsic enjoyment and effectiveness. This sense of duty, rather than voluntary enjoyment, may be associated with the low correlation between PA and motivational levels. Additionally, devout college-attending mothers studying at BYU may experience heightened expectations of perfectionism, both for themselves and others, further reinforcing the pattern of viewing PA as a necessary obligation rather than an enjoyable activity.

**Limitations**

The generalizability of this study’s findings is limited by several key factors inherent to the participant demographic and the study environment. The participants, predominantly affiliated with the Church sponsored university, exhibit behaviors and motivations that are deeply associated with specific religious and institutional values. This includes a commitment to the health principles outlined in the Word of Wisdom, which promotes not only abstinence from certain substances but also a lifestyle of healthful living. These principles encourage physical activity, proper nutrition, and adequate rest, which may not be as emphasized or prevalent in other college settings or among different demographic groups (Brigham Young University, n.d.; D&C 89: 1–21).

Additionally, the majority of the study’s participants are married women in their twenties with young children, a demographic that might have support systems and life circumstances not shared by other college students, including single mothers or those attending different types of institutions without an underlying religious sponsor.

This study also reflects the mothers’ intrinsic motivation and self-determined regulation, driven by personal goals and internal values rather than external pressures. This level of
motivation may differ significantly from populations without similar religious or cultural association (Dollahite et al., 2017; The Church, 2015).

Hence, while the findings provide valuable insights into the behaviors and motivations of this specific group, caution must be exercised when extrapolating these results to broader populations. The unique combination of religious affiliation, institutional culture, and demographic characteristics of the study participants creates a context that is not widely replicable, limiting the applicability of some findings to other groups.

**Implications for Future Research**

The identified limitations underscore the critical need for careful methodological planning in future research. To mitigate challenges encountered in survey completion, future studies should consider implementing additional measures to ensure that all participants can complete the survey accurately and thoroughly. Strategies might include conducting pilot tests with a representative sample can identify confusing questions before full distribution. Providing detailed instructions, tutorials, and support can help participants understand and complete the survey accurately, simplifying the survey design, providing clear instructions, and offering support or reminders to participants.

Moreover, future research could benefit from incorporating a control group to enhance the examination of causality between self-determination in exercise and its relationship to quality of life. For instance, comparing outcomes between female college students with at least one child who engage in regular exercise and those who do not, or even including students without children, can provide more robust findings. This approach allows researchers to attribute observed differences directly more confidently to the exercise behaviors being studied, thereby enhancing the reliability and validity of the research findings.
Incorporating qualitative research or a mixed-methods approach might provide deeper insights into the challenges and motivations faced by young college-attending mothers—as wives, mothers, and students—alongside the relationship between PA, well-being, and quality of life. This nuanced exploration will reveal the intricate balance between personal motivations, the ethics of motherhood, and socio-cultural correlations with PA.

Methodological rigor can be enhanced by pilot testing surveys, providing clear instructions and support, including control groups to examine causality, and incorporating qualitative or mixed methods. This would yield deeper insights into how personal motivations, motherhood responsibilities, and sociocultural factors influence the physical activity, well-being, and quality of life of college-attending mothers. Such insights can guide more effective support and interventions for this population.

Conclusion

This study highlights the crucial role of self-determination in correlating with PA and quality of life among female college students with biological children. It considered the prenatal and postnatal hormonal changes experienced by these young mothers within a religious, educational environment, particularly at BYU Provo and BYU-Pathway Worldwide. Our comprehensive analysis, grounded in SDT, reveals how intrinsic motivation and various regulatory types are associated with PA behaviors and overall well-being. The research utilized rigorously validated instruments such as the GSLTPAQ to assess activity levels, the BREQ-2 for motivational regulation, and the WHO-5 to measure well-being, ensuring a thorough evaluation of the constructs.

Our findings from 264 college-attending mothers, predominantly affiliated with the Church, show a notable commitment to PA. This commitment correlates with surpassing the
engagement levels of general college female students nationwide and exceeding U.S. PA guidelines (ACSM, 2019; USDHHS, 2018). Around 75% of the participants, primarily undergraduate students married in their twenties and thirties (Table 1), demonstrated a robust commitment to health that is significantly associated with a modest level of intrinsic motivation. This motivation is likely linked to adherence to BYU’s health code, the Word of Wisdom, and personal beliefs, reflecting a unique cultural association with PA behaviors. Despite challenges like balancing academic responsibilities and parenting duties, over 61% of these mothers maintain moderate overall well-being.

The correlation analysis reveals an SDT simplex pattern, indicating a significant, albeit low, positive correlation between intrinsic motivation and enhanced life quality through active PA participation. This suggests that various unique group factors may relate to the expected SDT relationship between PA, intrinsic motivation, and well-being, highlighting the complex and multifaceted nature of motivation in this setting.

As BYU’s programs continue to gain international recognition, the university is exceptionally well-positioned to establish a benchmark for how educational institutions can effectively support parenting students. These initiatives are poised to prepare these mothers and their families to become role models and leaders, thereby enhancing global communities both physically and psychologically. The university’s strategic approach not only correlates with improvements in the lives of these mothers but also promotes the adoption of supportive educational strategies worldwide. This aims to elevate the educational experiences of parenting students globally and foster societal progress through enlightened and empowered education.

This study confirms the substantial relationships among self-determination, PA, and psychological well-being of college-attending mothers within the BYU environment. It
advocates for continued research and development in supportive strategies that enhance both individual, family and societal well-being, demonstrating the interconnected nature of these elements and their broader implications for educational policy and practice.
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Memorandum

To: David Barney
Department: BYU - EDUC - Teacher Education
From: Sandee Aina, MPA, HRPP Associate Director
        Wayne Larsen, MAcc, IRB Administrator
Date: August 21, 2023
IRB#: IRB2023-242
Title: Self-Determination Towards Regular Exercise Impacts on Quality of Life in Female College Students with at Least One Child

Brigham Young University’s IRB has approved the research study referenced in the subject heading as exempt, category 2. This study does not require an annual continuing review. Each year near the anniversary of the approval date, you will receive an email reminding you of your obligations as an investigator and to check on the status of the study. You will receive this email each year until you close the study.

The study is approved as of 08/21/2023. Please reference your assigned IRB identification number in any correspondence with the IRB.

Continued approval is conditional upon your compliance with the following requirements:

1. A copy of the approved informed consent statement can be found in iRIS. No other consent statement should be used. Each research subject must be provided with a copy or a way to access the consent statement.
2. Any modifications to the approved protocol must be submitted, reviewed, and approved by the IRB before modifications are incorporated into the study.
3. All recruiting tools must be submitted and approved by the IRB prior to use.
4. Instructions to access approved documents, submit modifications, and report adverse events can be found on the IRB website, iRIS guide: https://irb.byu.edu/iris-training-resources
5. All non-serious unanticipated problems should be reported to the IRB within 2 weeks of the first awareness of the problem by the PI. Prompt reporting is important, as unanticipated problems often require some modification of study procedures, protocols, and/or informed consent processes. Such modifications require the review and approval of the IRB. Please refer to the IRB website for more information.
APPENDIX B

Survey Questionnaires

Female College-Attending Students’ Motivation Toward Regular Exercise Impacts on Quality of Life Survey

Introduction - This survey explores the exercise habits and well-being of female students attending Brigham Young University (BYU) and BYU-Pathway Worldwide. All responses are anonymous and will be confidential. By completing this survey, you consent to be in this research study. Participation in this study is entirely voluntary and without compensation, and you are free to stop at any time. Your active participation and completion of this survey are significant and greatly appreciated.

Instructions - Please read each question carefully and select the response that best reflects your thoughts, feelings, and behaviors regarding exercise and well-being. No right or wrong answers exist, so please answer as honestly and accurately as possible.

DEMOGRAPHICS: Question 1-8

What is your gender?
  - Male (End of survey if Male is selected)
  - Female
  - Prefer not to say

1. What is your age?
  - 18-25
  - 26-30
  - 31-40
  - 41-50
2. What is your marital status?
   - Single (never married)
   - Married
   - Divorced
   - Widowed
   - Separated

3. Number of biological child/children residing with you at least 50% of the time (If 0 is selected will direct go to question #5):
   - 0
   - 1
   - 2
   - 3
   - 4+

4. What is the age range of your child/children?
   - 0-6
   - 7-12
   - 13-17
   - 18+

5. Occupation (full-time student means taking 12 credit hours or more):
   - Full-time student with full-time job
   - Full-time student with part-time job
   - Part-time student with full-time job
• A part-time student with part-time job
• Full-time student not currently employed
• Part-time student not presently employed

6. What is your Ethnicity?
• American Indian or Alaska Native
• Asian
• Black or African American
• Caucasian
• Hispanic
• Pacific Islander

7. What is your current residency:
• On-BYU Provo campus
• BYU Provo student lives off-BYU Provo campus in the United States
• BYU-Pathway student lives off-BYU Provo campus in the United States
• BYU-Pathway student lives off-BYU Provo campus out of the United States

8. Current College Year Classification:
• Freshmen Year
• Sophomore Year
• Junior Year
• Senior Year
• Graduate Student

GODIN: Question 9 - 11
Please indicate that, over the past month, how many times per week you engage in each of the following exercise types. (Select 10 for 10 or more times)

9. Vigorous exercise (heart beats rapidly) for at least 15 minutes at a time: ________ times per week

10. Moderate exercise (not exhausting) for at least 30 minutes at a time: ________ times per week

11. Walking (for leisure or transport) for at least 30 minutes at a time: ________ times per week

BREQ-2: Question 12 - 30

CHOOSE THE RESPONSE THAT BEST REFLECTS YOUR FEELINGS AND THOUGHTS REGARDING THE STATEMENT.

When making your ratings, please rely on your first impression and work independently.

Please rate the statements based on the following scale:

0 = Not true for me

1 = Barely true for me

2 = Moderately true for me

3 = Mostly true for me

4 = Very true for me

12. I exercise because other people say I should. 0 1 2 3 4

13. I feel guilty when I do not exercise regularly. 0 1 2 3 4

14. I value the benefits of regular exercise. 0 1 2 3 4

15. I exercise because it is fun. 0 1 2 3 4

16. I do not see why I should have to exercise. 0 1 2 3 4
17. I take part in exercise because my friends/family say I should. 0 1 2 3 4
18. I feel ashamed when I miss an exercise session. 0 1 2 3 4
19. It is important to me to exercise regularly. 0 1 2 3 4
20. I cannot see why I should bother exercising. 0 1 2 3 4
21. I enjoy my exercise sessions. 0 1 2 3 4
22. I exercise because others will not be pleased with me if I do not. 0 1 2 3 4
23. I do not see the point in exercising. 0 1 2 3 4
24. I feel like a failure when I have not exercised in a while. 0 1 2 3 4
25. I think it is important to make an effort to exercise regularly. 0 1 2 3 4
26. I find exercise a pleasurable activity. 0 1 2 3 4
27. I feel under pressure from my friends/family to exercise. 0 1 2 3 4
28. I get restless if I do not exercise regularly. 0 1 2 3 4
29. I get pleasure and satisfaction from participating in the exercise. 0 1 2 3 4
30. I think exercising is a waste of time. 0 1 2 3 4

WHO-5: Question 31 -35

Please rate the statements in relation to your experiences over the past two weeks based on the following scale:

0 = At no time
1 = Some of the time
2 = Less than half of the time
3 = More than half of the time
4 = Most of the time
5 = All the time
31. I have felt cheerful and in good spirits. 0 1 2 3 4 5
32. I have felt calm and relaxed. 0 1 2 3 4 5
33. I have felt active and vigorous. 0 1 2 3 4 5
34. I woke up feeling fresh and rested. 0 1 2 3 4 5
35. My daily life has been filled with things that interest me. 0 1 2 3 4 5

Thank you for your responses.

Please note that your participation in the survey has been recorded. Your input on student well-being is invaluable to the research process and is greatly appreciated.

For any inquiries about your research participant rights, please get in touch with the BYU Human Research Protections Program at 801-422-1461 or BYU.HRPP@byu.edu.