

Black Butterflyz:
A physical activity intervention to improve the health of Black women

by

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Abstract

Black women are disproportionately impacted by issues of obesity, cancer, hypertension, and a host of other chronic diseases. To exacerbate matters, 82% of this population reports being overweight and 53% report being obese. Of the aforementioned chronic diseases and BMI classifications, physical inactivity serves as a key modifiable risk factor to address these health disparities faced by Black women.

The purpose of Black Butterflyz was to develop an evidence-based, culturally-relevant intervention to increase physical activity among Black women. Formative research was conducted to identify barriers impacting physical activity along with preferred methods of physical activity among this target population. Based on the findings, lack of African American female role models engaged in physical activity, lack of knowledge, and lack of social support rose to the surface as key barriers impacting Black women's engagement in physical activity. Furthermore, walking was identified as the preferred method of physical activity.

In order to move inquiry into action, the Black Butterflyz intervention was developed. Black Butterflyz, a culturally-tailored 26-week walking intervention, was developed to provide social support while increasing participants' levels of physical activity. The first 13 weeks (Phase I) of this 26-week intervention was conducted by the lead researcher while the second 13-weeks (Phase II) was conducted by trained volunteers within Black Butterflyz.

Participants completed pre- and post-intervention measures of physical activity, social support, autonomy, motivation, and mood. Black Butterflyz resulted in a significant increase in leisure time walking ($Z=-2.7, p=.007$), moderate-intensity leisure-time physical activity ($Z=-2.3, p=.02$), total leisure time physical activity ($Z=-2.7, p=.006$) and exercise specific social support from friends ($t(44)=-3.13, p=.003$). Additionally, increases in leisure time physical activity were associated with increases in mood ($r=.307, p=.042$).

The Black Butterflyz findings identify a strong need to train Black women to become group exercise instructors so they may single handedly and simultaneously address the three identified barriers impacting physical activity engagement among Black women-1) they become the role model, 2) they have the knowledge about physical activity and can impart that wisdom upon their respective communities, and 3) their presence provides social support.

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Preface

The Kujma Model represents the voice and the ideals of *one* Black woman. I absolutely do not claim to speak on behalf of all 37 million Black women in the United States.

Dedication

Black Butterflyz is dedicated to Clara M. Simmons who earned her wings from a 26-year battle with cancer on March 31, 2016 at 10:20am. Mama, you are loved, missed, and channeled through the present and future work designed to improve the health and wellbeing of Black women. Your death marked the birth of a new purpose and every single day I breathe, I will remember and honor your last breath. I love you!

Chapter 1 - Introduction

Black women are deserving of our full attention. They are beautiful beings worthy of not just being seen; they are worthy of being heard. They are grandmothers, mothers, daughters, aunts, nieces, and cousins. Black women are my sisters; my family. However, they are also disproportionately impacted by health disparities that threaten to reduce their quality and/or limit their quantity of life. Of all the dynamic attributes that Black women possess, they also possess the lowest ranking among almost all health indicators. Black women represent the most obese demographic group (CDC, 2019), they have a vastly greater percentage of death from chronic diseases (ACS, 2016; CDC, 2019), and are ranked as the lowest race and gender demographic group to achieve recommended levels of physical activity (Joseph, Ainsworth et al., 2015).

Health Disparities

Statistically speaking, 82% of Black women are either overweight or obese (Schiller, Lucas, Peregoy, 2012). However, body shape satisfaction among this population tends to be higher compared to that of white women (Tennent, 2015). With the disconnect between the medical community's constructs, Black women's body shape acceptance, and limited culturally-appropriate interventions, the issue of health disparities becomes even more complex for public health professionals and researchers.

Barriers to Physical Activity

The WHO (2019) identifies physical inactivity as an important modifiable risk factor that is linked to obesity and other chronic diseases. Besides the common barriers of knowledge and

social support, Black women are also faced by two unique challenges that are not as easily modifiable and will require a concerted effort to overcome—the media and ethics of care.

Media

Research has found that in predominantly African American magazines, a higher proportion of negative health-related ads than positive ads contained Black faces. In the mainstream magazines, however, White faces were almost completely absent from negative health-related ads and appeared frequently in positive health-related ads (Duerksen et al., 2005).

Ethics of Care

Black women are typically the primary caregivers of their households and often times feel a sense of moral obligation to tend to the needs of others over self. Some Black women perceived physical activity as a “selfish” or “self-indulgent” behavior. They felt that taking time to engage in physical activity limited the time they could spend with their families (Im et al., 2012; Harley et al., 2009).

Theoretical Framework

To address the aforementioned barriers to physical activity, it was important to ground Black Butterflyz in theory. This intervention was informed by the fusion of two behavior change theories along with one communication theory. Bandura’s Social Cognitive Theory (SCT) was the first of two behavior change theories (Bandura, 2004). SCT is a commonly used theoretical model for understanding physical activity behavior (Phillips & McAuley, 2013).

SCT provides a comprehensive and reciprocal framework to explain the factors which can influence physical behavior -the environment, the person, and the behavior. For the Black Butterflyz intervention, there was a focus on the social support aspect of the environment. The second behavior change theory was Ryan and Deci's (2000) Self Determination Theory (SDT). SDT is a theory of motivation that addresses autonomy, competence, and psychological relatedness. Relatedness, within the Black Butterflyz intervention, focused more on representation and cultural relatedness than the psychological aspect; however, autonomy was fully adopted as a key construct within the new model developed for this intervention. Lastly, McAdams and McLean's Narrative Identity Theory (2013) was used to inform the Black Butterflyz intervention due to its exploration of how a person's internalized and evolving life story provides life with some degree of unity and purpose. Key elements from each of the aforementioned theories were critical to the development of a new, culturally- relevant behavior change model that was developed to address physical activity among Black women.

The Kujima Model of Change incorporated principles from Bandura, Deci, Ryan, McAdams and McLean, but the cultural underpinnings were adopted from Kwanzaa-an African American cultural celebration honoring heritage, family, and community (Karenga, 2018). The term *Kujima* is the creative fusion of two prominent Kwanzaa principles-Kujichagulia (pronounced koo-jee-cha-goo-LEE-ah) meaning Self Determination and Ujima (pronounced oo-JEE-mah) meaning Collective Work and Responsibility. Within the Kujima Model, self-determination is conceptualized to mean the ability to be independent and self-governing with a firm purpose. The concept of collective work and responsibility is conceptualized to mean the commitment to *active and informed togetherness* for a particular purpose.

Table 1. Kwanzaa Principles

Principle	Pronunciation	Definition
Umoja	oo-MO-jah	Unity
Kujichagulia	koo-gee-cha-goo-LEE-yah	Self-Determination
Ujima	oo-GEE-mah	Collective Work and Responsibility
Ujamaa	oo-JAH-mah	Cooperative Economics
Nia	nee-YAH	Purpose
Kuumba	koo-OOM-bah	Creativity
Imani	ee-MAH-nee	Faith

Kujima Model and Social Support

The Kujima Model proposes that it is Black women’s collective work and responsibility (social support) to improve the health of our respective communities. Communities can be defined in the broad sense to include large geographic locations or a narrow explanation to include one’s family, friend circle, church, or neighborhood (Joseph, Ainsworth, Mathis, Hooker & Keller, 2017).

Kujima Model and Relatedness

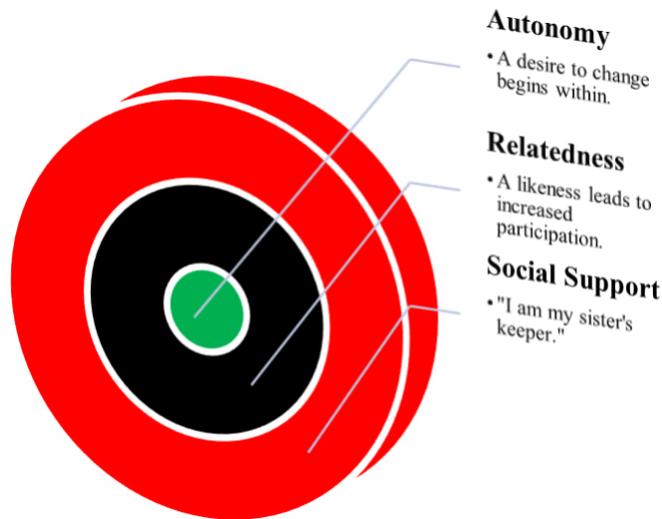
The relatedness construct of the Kujima Model proposes that, through the adoption of narrative identity theory (McAdams & McLean, 2013), Black women can identify with other Black women through their shared experiences, barriers, facilitators, and stories related to their personal health and wellness journeys.

Kujima Model and Autonomy

The Kujima Model proposes that the strength of one’s autonomy is magnified by the strength of the previous principles, social support and relatedness. A Black woman’s autonomy

is directly linked to her ability to define herself for herself which can ultimately lead to increased levels of physical activity along with the accumulation of substantial health benefits (McEwan & Sweet, 2012).

Figure 1. The Kujima Model Constructs



Purpose

The development of Black Butterflyz as well as the aforementioned exploratory model of change represented a familial duty to my kinfolk—the sisters, daughters, aunts, nieces, cousins, and grandmothers I have never met but am connected to through our cultural experiences and magnificent melanin. Black Butterflyz, a culturally-relevant, evidence-based, physical-activity intervention is the public health version of the urban clothing line, FUBU. FUBU, For Us By Us, was developed by a team of African American men with African Americans in mind. Their foundational philosophy was to “make clothing for the consumer by the consumer” (FUBU, 2019) Black Butterflyz was designed by a Black woman for Black women and facilitated by Black women in order to improve their health and wellbeing.

The overall purpose of this study was to examine whether participants would report changes in physical activity levels as they experienced an increase in autonomous motivation, exercise-specific social support, and the opportunity to be involved in an intervention that was culturally tailored with them in mind.

RQ1 – Would a culturally-sensitive, physical activity intervention designed by and administered to Black women increase physical activity among this population?

H1 – Black women will engage in increased levels of physical activity after participation in a culturally-tailored intervention.

RQ2 – Would exercise-specific social support increase as a result of participation in a culturally-tailored physical activity intervention targeting Black women?

H2 – Black women thrive in settings where social support is exchanged; therefore, exercise-specific social support will increase as a result of participation in a culturally-tailored physical activity intervention.

RQ3 – Which Kwanzaa principles are the driving influences of physical activity engagement among Black women?

H3 – Of the seven Kwanzaa principles, Kujichagulia (Self Determination) and Ujima (Collective Work and Responsibility) would show the largest increases after participation in the culturally tailored physical activity intervention.

Chapter 2 - Literature Review

Health Disparities

A plethora of health disparities disproportionately impact Black women, but diabetes, heart disease, stroke, and some types of cancer (CDC, 2014) have a vast imbalance when it comes to this target population. African Americans are 80% more likely than non-Hispanic white adults to have been diagnosed by a physician to be diabetic (US Department of Health and Human Services [USDHHS], 2018A), 42% more likely to die from cancer (American Cancer Society, 2016), 40% more likely to die from heart disease (USDHHS, 2018B), and African American women are 60% more likely than non-Hispanic white women to have high blood pressure. The common links associated with these leading causes of death and disease are physical inactivity and obesity; therefore, the gravity of this issue should be of extreme importance to Black women and public health officials considering the fact that only 34% of this population achieves recommended physical activity levels (Joseph, Keller et al., 2017).

The general population, which includes Black women, understands that there are myriad health benefits associated with engaging in physical activity. Those benefits include, but are not limited to increased energy, better sleep, enhanced mood, a reduction in body fat, and protection against chronic diseases associated with obesity (Schmidt, 2016). Performing a cost-benefit analysis would lead one to argue that most people would engage in physical activity because of the significant benefits that lead to an enhanced quality of life. However, this analysis would yield false if performed. Approximately 80% of Americans do not exercise regularly enough to receive physiological benefits and 50% of the American adult population does not currently attain recommended levels of physical activity (CDC, 2014).

For substantial health benefits, the US Surgeon General's physical activity guidelines still recommend adults, ages 18 to 64, should perform at least 150 minutes a week of moderate-intensity, or 75 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination while also including two or more days of muscle strengthening activities to target all major muscle groups. One of the most significant changes over the last 10 years and a critical application towards addressing physical inactivity among Black women is the public acknowledgement and clearly stated evidence that, "For individuals who perform no or little moderate-to-vigorous physical activity, replacing sedentary behavior with light-intensity physical activity reduces the risk of all-cause mortality, cardiovascular disease incidence and mortality, and the incidence of type 2 diabetes" (Office of Disease Prevention and Health Promotion [ODPHP], 2019).

The World Health Organization (1999) reported that obesity is largely preventable through lifestyle changes. With 57% of Black women categorized as obese compared to 34% of white women (Ogden, Carroll, & Flegal, 2014), a lifestyle change to include physical activity has the potential to greatly address the issue of health disparities while simultaneously improving the health outcomes of Black women. Unfortunately, adopting a physically active lifestyle is not as simple as waving a magic wand of wellness. Black women are faced with a host of obstacles ranging from "knowledge," "environmental," "media," and "ethics of care." Each of these barriers serves as a potential roadblock to positive changes and further perpetuates the vicious cycle of physical inactivity and overweight/obesity.

Barriers to Physical Activity

Barriers to physical activity impacting Black women can be actual or perceived; however, the resulting action is the same-limited or non-existent physical activity. Research has commonly identified four key barriers impacting Black women:

Knowledge Barriers

As the biblical passage states, “My people perish for lack of knowledge” (Hosea 4:6, New International Version). To perish, meaning *to be destroyed*, is a very finite outcome that appears to have little applicability to the concept of health; however, without good health, death becomes a more pressing inevitability. Consequently, without adequate knowledge pertaining to physical activity’s impact on one’s lifestyle and health habits, Black women’s ability to make positive course corrections becomes limited (Bandura, 2004). Black women’s lack of knowledge regarding physical activity, according to Joseph, Ainsworth et al. (2015), falls under two key categories: perception and lack of knowledge.

Perception: African-American women believe they get enough physical activity through their daily activities (Pekmezi et al., 2013; Walcott-McQuigg & Prohaska, 2001).

Lack of Knowledge: It is reported that Black women lack knowledge pertaining to how to use exercise equipment and/or what is regarded as *physical activity*. (Im et al., 2012; Bopp et al., 2007; Wilcox, Oberrecht, Bopp, Kammermann, & McElmurray, 2005).

Environmental Barriers

Accessibility and safety are factors that prevent Black women from engaging in physical activity. In the Community Insight study of African American and Hispanic women, perceived safety and criminal activity were the most commonly mentioned reasons why women found their neighborhoods to be unsupported for physical activity engagement (Mama et al., 2015). Additional environmental barriers preventing Black women from engaging in physical activity include lack of places to exercise or walk, a lack of time because of work or taking care of others (ethics of care), and lack of social support from friends, family, and community (Adam, Burns, Forehand, & Spurlock, 2015).

Media Barriers

Over 40% of Americans consistently rely on the internet and social media more than any other source for information on health (Warden, 2017); therefore, it is imperative to use media to deliver culturally-appropriate health messages targeting African American women. The problem, and resulting barrier, occurs when images in the media only portray a singular story regarding Black women. Singular stories such as lazy, overweight, and physically inactive to name a few. Additionally, and even more common and concerning, is the over saturation of White faces associated with positive health, physical activity, and happiness (Brodie, Kielson, Hoff, & Parker, 1999).

Omonuwa and Bradford (2001) found that Black oriented magazines place more attention on hair styles and fashion while White oriented ones had a bigger focus on health-related content. Ultimately, magazines, the internet, and television have the power to influence behavior,

contribute to individuals' knowledge and provide cues prompting individuals to engage in health promoting behaviors (Prentice-Dunn & Rogers, 1986).

Ethics of Care Barriers

According to the definition, ethics of care is a normative ethical theory that holds that moral action centers on interpersonal relationships and care or benevolence as a virtue (Held, 2005). In the Black community, this theory is fully embraced and honored; almost to a fault. In an overwhelming number of qualitative studies conducted over the last 20 years, Black women expressed that they were the primary caregivers of their households and responsible for a variety of household tasks ranging from childcare, meal preparation, laundry, and cleaning. This second “job” provided little to no time to engage in physical activity (Bopp et al., 2007; Joseph, Ainsworth et al., 2015).

Black women are dynamic human beings with a unique set of barriers, needs, and resulting health outcomes. To honor the strengths and challenges faced by Black women, a culturally-significant approach to behavior change needs to be developed. The behavior change model needs to be primarily informed by the important tenets of Black life and be inclusive of key constructs from established behavior change theories. The blending of these two elements have to potential to result in a new and improved way to increase physical activity among Black women.

Kujima Model

With the multitude of theories developed to address health behaviors and the enormous body of evidence supporting physical activity, one must ask what is the missing link when it

comes to improving the health of Black women? Physical activity is a key modifiable risk factor, but, very few behavior-change theories culturally address the needs of Black women. In order to address this significant oversight, from a theoretical perspective, I developed an Afrocentric model of change.

Afrocentric theory, developed by MK Asante during the 1980's, proposes that African Americans celebrate themselves rather than adhering to specific racial, body image, and hair standards of beauty (Tennent, 2015). In celebrating the self, an individual learns to define themselves for themselves thereby increasing their level of autonomy. And, when several Black women begin the journey of self-celebration, a movement of social support begins to form leading to a powerful position of positive changes both at the individual and community levels.

As a way to honor the African ethical imperative of *serudj ta*, "to constantly reimagine, renew, and remake the world" the Kujima Model was developed utilizing Kwanzaa principles, the strengths associated with Afrocentric Theory, and grounded in previously tested behavior change theories-Bandura's Social Cognitive Theory (2004), Deci and Ryan's Self Determination Theory (2000), and McAdams and McLean's Narrative Identity Theory (2013).

Ujima(v): Collective work and responsibility

Primary Behavior Change Theory: Social Cognitive Theory (Bandura, 2004)

Adopted Construct: Social Support

To successfully adopt a lifestyle of physical activity, Black women greatly benefitted from social support gathered from family members, friends, and/or co-workers (Joseph, Keller et

al., 2017). Furthermore, social support became a source of motivation for physical activity maintenance and enjoyment (Springer, 2013; Kirchhoff, Elliott, Schlichting, & Chin, 2008). The ability to provide social support in these various contexts, family, friend circle, church, etc., allows for Black women to strategically address the ethics of care barrier by fulfilling a “moral obligation” to assist others while simultaneously improving their own health.

Kujichagulia (v): To define ourselves for ourselves

Primary Behavior Change Theory: Self Determination Theory (Ryan & Deci, 2000)

Adopted Construct: Autonomy

The start of any change begins with the person. In this respect, The Kujima Model proposes that the motivation obtained by Black women’s ability to define themselves for themselves is imperative for Black women to internalize the desired change and enhance self-regulation (Ryan & Deci, 2000). An internalized desire can boost self-efficacy; thereby, increasing Black women’s ability to adopt and organize certain behaviors. Higher levels of self-efficacy can significantly help Black women participate in and maintain regular physical activity (James, Pobee, Oxidine, Brown, & Joshi, 2012; Whitt-Glover, Goldmon, Karanja, Heil, & Gizlice, 2013).

Umoja(n): *Unity*

Primary Behavior Change Theory: Self Determination Theory (Ryan & Deci, 2000) blended with Narrative Identity Theory (McAdams & McLean, 2013)

Adopted Construct: Relatedness

The Kujima Model takes an expanded approach to the traditional construct of relatedness. Typically, relatedness is viewed as a universal desire to interact, be connected to, and experience caring for others (Deci & Ryan, 2008). The Kujima Model accepts this approach but focuses on relatedness through the lens of representation. The ability to see Black people, especially women, engaged in an array of health promoting behaviors presents new possibilities of engagement and serves as cues promoting Black women to take protective action (Prentice-Dunn & Rogers, 1986). Additionally, the relatedness construct is then coupled with the core foundational beliefs of Narrative Identity Theory (NIT). NIT maintains that the manner in which people tell stories about their lives may predict certain outcomes, such as their quality of life (McAdams & McLean, 2013).

Physical Activity Interventions

Although obesity is a preventable risk factor for the top three leading causes of death, there is a need to shift the focus from this medical construct and start examining the context of physical activity among Black women (Nelson, Horner-Ibler, Harris, & Burns, 2016). Moving more and living better is a common behavior change goal; however, certain forms of movement have been found to be more accessible and provide fewer barriers to engagement. Walking is one such form of physical activity. Walking is a simple, cost-effective form of physical activity with minimal risks. It was suggested by the 2008 Physical Activity Guidelines for Americans and is a proven strategy with a plethora of health benefits such as reducing the likelihood of developing cancers, hypertension, and other chronic diseases such as obesity; the very diseases that disproportionately impact Black women (ODPHP, 2019). Research supports that home or community-based walking interventions are effective strategies to promote increased levels of

physical activity among African American women (Lisovics, Johnson, & Higginbotham, 2006). The Deep South Network (DSN) Walk is one such strategy.

The DSN for Cancer Control is an academic-community partnership that was developed to address physical activity and cancer among African American women living in Alabama and Mississippi. The DSN Walk program is a population-based walking intervention that focused on encouraging participants to increase physical activity by joining structured DSN Walk teams and committing to a walking program for 30 months (Baskin et al., 2011).

Through an adoption of the Community Based Participatory Research Model, the DSN network discovered the primary influencing factor to increase African American women's levels of physical activity was through social support (Dunn, 2008). The concept of collectivism, the emphasis on collective rather than individual action or identity, was strongly supported by DSN Walk. The collective African-American community and culture might have more social influence on an individual than any other important influence (Peters, Aroian, & Flack, 2006). Furthermore, Kujima Model supports these findings due to its foundational roots built upon *Ujima*, the principle of Collective Work and Responsibility.

The Women's Walking Program, a Chicago-based walking program, is another example of an effective fusion of a home and community based physical activity intervention (Ingram, Wilbur, McDevitt, & Buchholz, 2011). This program targeted sedentary Black women with elevated risks for cardiovascular disease between the ages of 40 and 65. Worth noting is that Women's Walking Program was designed in collaboration with African American women. This is an

important observation because intervention attractiveness rates are greater when there is a race/ethnic match between the participants and the facilitators (Ingram et al., 2011).

In addition to the tailored walking prescriptions of the Women's Walking Program (30 minutes of walking, 3 to 4 times a week, at moderate intensity self-monitored with heart rate monitors), the participants interacted with a mobile-health component of the intervention-keeping logs of their walks and entering the information into an automated telephone response system as well as staff contacts via telephone (Ingram et al., 2011). The Ingram and colleagues study (2011) identified that receiving telephone contacts kept participants accountable and made the participants feel important. However, this method of human accountability can also encourage avoidance if the participant feels they did not achieve their goals or live up to the callers' expectation(s) This dichotomous conflict between accountability and avoidance lends appreciation for text-messaging based interventions in order to remove the human component while keeping the social connection. This conclusion is also supported by Delores and colleagues' (2016) findings that Black women are willing to receive text messages as part of an e-Health/m-Health research study.

Gerber et al. (2009) conducted a text messaging feasibility study with 95 African American women between the ages of 30 and 65. During their four-month study, participants received three text messages per week to provide reminders to exercise, eat healthy, along with basic messages of motivation. The results of the pilot study identified that text messaging may be an effective means of providing follow up with participants and promoting healthy behaviors. Worth noting is that some of the older participants needed additional assistance and training.

Technology-based interventions have a significant public health impact due to their reach, immediacy, and low-cost delivery (Gerber et al, 2009). This potential impact coupled with the fact that 87% of African American adults own a mobile phone (Lenhart, 2013) creates an untapped opportunity to enhance the health and well-being of Black women. To support this belief, Joseph et al., (2015) conducted an 8-week, technology (Facebook and text messaging) versus print intervention and discovered that Black women who received the technology intervention reported significant post-intervention improvement in self-regulation for physical activity.

Traditional and technology-based physical activity interventions can innovatively address health disparities while enhancing the health and well-being of Black women. Building on the wealth of information regarding disparities, barriers, theories, and interventions, Black Butterflyz, will add to this growing body of knowledge while simultaneously improving the health and wellbeing of Black women.

Chapter 3 - Methods

Study design and study population

Black Butterflyz, a 26-week, multi-phased walking intervention, was implemented in the capital of Kansas. Although Black women make up less than 5% of the population of Topeka, KS, this capital city was identified because it was ranked as the eighth fattest city in the nation in 2012 (Bryner, 2012) and obesity rates were steadily rising in 2018 (State of Obesity, 2017). With the goal of targeting between 1% of the total Black female population (6,994 people) and 5% of the pre-identified (ages 39-64) Black female population (2,285 people), Black Butterflyz set a goal to recruit between 69 and 109 Black women for this study.

The age range 39 to 64 was intentionally selected because of the various transitional phases represented within that grouping. The transition into one's 40s typically represents a period of reflection and new appreciation for life; it also marks a period of empty nesting for those women who had children. The transition into one's 50s is commonly marked by the onset of menopause. The National Institute on Aging (2017) report that post-menopausal women are more vulnerable to heart disease. With Black women being 40% more likely to die from heart disease (OMH, 2018), this intervention serves as an ideal opportunity to intervene.

Black Butterflyz study participants met the following inclusion criteria: a) self-identified as a Black woman, b) between the ages of 39 and 64, and c) able to pass the Physical Activity Readiness Questionnaire (Quinn, 2018). Based on the aforementioned inclusion criteria, 94 participants enrolled in the study.

During the formative research phase of Black Butterflyz, an online, anonymous survey was administered to 130 Black women, between the ages of 39 and 64 to identify their preferred methods of physical activity. Of the seven options offered (walking, jogging, running, swimming, dancing, lifting weights, and other), participants could only select one option and the overwhelming preference was walking (n=102). Additionally, informal focus groups were conducted to identify key barriers to physical activity that would later inform the Black Butterflyz intervention-lack of African American female role models engaged in physical activity, lack of knowledge about physical activity, and lack of social support for physical activity.

Participants completed measures of physical activity, autonomy, social support, and mood followed by opportunities to join walking groups led by the lead researcher during Phase I. The Saturday morning, 60-minute sessions, consisted of an attendance roll call, a 5-minute warm up, 30 to 40-minute walk, and cool down session that adhered to the evidence-based Walk With Ease curriculum provided by the Arthritis Foundation trainings. Participants were encouraged to let that Saturday morning walk serve as the spring board for their weekly challenge to get 30 minutes of physical activity most days of the week. Phase II followed a similar sequence to include attendance, warm up, activity, and cool down. However, trained volunteers within Black Butterflyz, identified as Monarchs, led these 60-minute sessions multiple days of the week and at multiple locations. Each Monarch advertised and promoted her walk on the Black Butterflyz Facebook page and website. Plus, a postcard sized calendar was printed to promote the various walks. Each phase consisted of 13 weeks. The complete 26-week intervention also served as a way to pay homage to my mother's 26-year battle with cancer.

Procedures

The institutional review board of Kansas State University approved this study. Information about the study was distributed via social media outlets and the front page of the local major newspaper -Topeka Capital-Journal. Women interested in participating in the study contacted the lead researcher either by Facebook, email, or text messaging. Prior to enrolling, interested participants were invited to a “meet-and-greet” mixer to learn more about Black Butterflyz and meet potential enrollees. After enrolling, a motivational interviewing session was scheduled with the first 25 enrollees as an incentive for early enrollment (Appendix A). Before the intervention began, participants read and signed consent forms, completed an online questionnaire, and were invited to participate in optional biometric screenings.

As the lead researcher and a proud Black woman with two decades of public health experience, it was imperative to design an intervention specifically for Black woman because of my personal association with this target population and the research related to matching. There tends to be an increase in participation rates when matching race and ethnicity of participants with that of leaders (Ingram et al., 2011).

The intervention included two 13-week walking phases punctuated by program enhancement opportunities offered as an intercession. Phase I, conducted by the lead researcher, included weekly walks, tracked with a sign in sheet, on Saturday mornings from 10am –11am, at the state capital and private access to a Black Butterflyz Facebook group. Participants utilized the Facebook group as an accountability check-in when they completed a 30-minute session of physical activity for the day. Participants’ postings were as simple as four letters, “D-O-N-E,” or

they represented a full explanation of the physical activity they participated in or any positive changes that occurred in their health and wellness journey. Furthermore, the Black Butterflyz’ Facebook group allowed for a calculated approach to addressing a pre-identified barrier to physical activity-*lack of social support*. Immediately upon posting, other participants could hit the like or comment button in order to show support for their fellow member of Black Butterflyz.

During Phase I, Black Butterflyz’ participants could watch customized, online, evidence-based education videos (Table 2) that I created to address the health needs and interests of Black women. Each video varied in length between 4 and 6 minutes and was aligned with two of the key constructs of the Kujima Model-Autonomy and Social Support. For example, week 2’s video, “Developing a Physical Activity Plan That Works for You,” supported the autonomy construct. Additionally, week 7’s video, “Developing a Social Support Network for Physical Activity,” supported the social support construct.

Table 2. Black Butterflyz Phase I Weekly Discussion Videos
[\(autonomy\)](#) [\(social support\)](#)

Week	Topic (Kwanzaa Principle)	Video Title
1	Autonomy (Kujichagulia-Self Determination)	<i>Overview of the National Physical Activity Recommendations and Physical activity statistics among Black women</i>
2	Autonomy (Kujichagulia-Self Determination)	<i>Developing a Physical Activity Plan That Works for You</i>
3	Autonomy (Kujichagulia-Self Determination)	<i>Redefining the Meaning of Exercise</i>
4	Autonomy (Kujichagulia-Self Determination)	<i>Thick Fit: Movement Matters at All Sizes</i>
5	Autonomy (Kujichagulia-Self Determination)	<i>The BMI is Not My Measure</i>

6	Autonomy (Kujichagulia-Self Determination)	<i>For the Health of It: Process vs. Outcome Goals</i>
7	Social Support (Ujima-Collective Work and Responsibility)	<i>Developing a Social Support Network for Physical Activity</i>
8	Social Support (Ujima-Collective Work and Responsibility)	<i>She is ME: Black Women Helping Each Other Engage in Physical Activity</i>
9	Social Support (Ujima-Collective Work and Responsibility)	<i>Accountability Partners: Understanding Personality Types</i>
10	Social Support (Ujima-Collective Work and Responsibility)	<i>Maintaining a Social Support Network</i>
11	Social Support (Ujima-Collective Work and Responsibility)	<i>Strategies for Maintaining a Physically Active Lifestyle</i>

Also, during Phase I, seven group leaders, referred to as Monarchs, enrolled in an online course offered through the Arthritis Foundation to become certified Walk With Ease instructors. Walk with Ease (WWE) was identified as an ideal training model because of its emphasis on walking. WWE is an evidence-based program that has been shown to help people with arthritis, or other related conditions, reduce pain, increase balance, strength and walking pace, and improve overall health. Monarchs incorporated their training into their individual walking sessions offered during Phase II.

During Phase II, in order to overcome the potential barriers of time and location, each Monarch identified a different day of the week, location, and time to offer their evidence-based walks. Some sites were led by two Monarchs. Walks were held on Monday evenings at the state Capitol, Tuesday early mornings at the local University, Thursday evenings at a heated pool, and Saturday mid-mornings at a bark park.

The Black Butterflyz intervention offered two voluntary program-enhancement options.

Enhancement option number one included pre- (one week prior to the launch of Phase I), mid-

(at the beginning of Phase II), and post- (at the end of Phase II) biometric screenings offered in partnership with the Topeka Black Nurses Association and Washburn University School of Nursing. These screenings measured height, weight, blood pressure, hip-to-waist ratio, and fasting blood glucose. Glucose was measured by a blood sample that was collected by a simple finger prick. Upon completion of the screenings, participants received a postcard sized information sheet where they could track their pre-, mid-, and baseline results. Enhancement option number two, an interactive-intersession offered between Phases I and II, consisted of yoga classes, community bike rides, and a mural painting. Additionally, a lunch and learn focus group was conducted between Phase I and Phase II to help identify what worked well during Phase I and make any necessary revisions prior to the launch of Phase II.

In addition to the program enhancement options, Black Butterflyz participants were extended the opportunity to receive personalized social support through text-messaging. Participants were asked to identify 13 personal reasons why they wanted to engage in physical activity (e.g. I want to be physically active for my future grandkids, I want to fit into a swimsuit this summer, etc.) and those reasons were to be texted out at the beginning of each week as a gentle reminder and a technological form of social support (Joseph, Keller et al., 2015).

Measures

Six survey instruments were used to measure the effectiveness of Black Butterflyz. All assessments were collected online at baseline and post-intervention.

International Physical Activity Questionnaire (IPAQ)

The IPAQ assesses physical activity undertaken across a comprehensive set of domains including: 1) leisure time physical activity, 2) domestic and gardening (yard) activities, 3) work-related physical activity, and 4) transport-related physical activity (Craig et al., 2003) For each activity type (i.e., walking, moderate, and vigorous) within a domain, participants reported the duration (in minutes) and frequency (days) of physical activity engagement during the past week. To control for outliers, the self-reported minutes of physical activity were truncated at a maximum of 3 hours per activity per day. Domain specific scores were calculated by summing the values for walking, moderate-intensity and vigorous-intensity activities within the specific domain. The IPAQ outcome variables reflect MET-min/week and the scale has an acceptable test-retest reliability (Craig et al., 2003). Metabolic Equivalents (METs) are a unit that describes energy expenditure for a specific activity (ODPHP, 2019).

To examine the leisure-time physical activity variables in terms of minutes, MET-minutes were converted into regular minutes as follows: leisure time walking MET-minutes were divided by 3.3, moderate-intensity physical activity MET-minutes were divided by 4, and vigorous-intensity physical activity MET-minutes were divided by 8.

Social Support for Exercise

The Social Support for Exercise scale is a 13-item survey developed to measure perceived social support for exercise behaviors (Sallis, Grossman, Pinski, Patterson, & Nader, 1987). This scale identifies 13 things friends or family might do or say to support someone who

is trying to exercise regularly. The Black Butterflyz intervention focused on the answers from friends. (Ex. During the past three months, my friend offered to exercise with me. During the past three months, my friend discussed exercise with me, etc.) Response choices ranged from “None” =1 to “Very often” =5, and a total score was calculated by summing all items. Internal consistency of this scale was good at baseline ($\alpha=.91$) and post intervention ($\alpha=.87$).

Treatment Self-Regulation Questionnaire (TSRQ)

The Treatment Self-Regulation Questionnaire is a theory-based, 15-item scale assessing different forms of motivation with responses given using a 7-point Likert scale ranging from “Not at all true” = 1 to “Very true” = 7. This scale was first developed by Ryan and Connell to assess individuals’ reasons for engaging in or changing a health behavior (Ryan & Connell, 1989). The version of the TSRQ used for the Black Butterflyz study included subscales assessing controlled regulation and autonomous regulation specific to exercise. Internal consistency of the autonomous regulation score was excellent (baseline $\alpha=.91$; post-intervention $\alpha=.93$); however, the consistency across items of the controlled regulation scale was much weaker (baseline $\alpha=.73$; post-intervention $\alpha=.62$). A relative autonomy index score was calculated by subtracting the controlled motivation subscale score from the autonomous motivation subscale score, such that higher scores reflected higher autonomous motivation.

Social Provisions Scale (SPS)

Cutrona and Russel’s Social Provision Scale (1986), a 24-item scale, was utilized to assess general social support and to specifically measure assistance-related functions such as reassurance of worth and non-assistance-related functions such as opportunity for nurturance. The SPS has six subscale scores 1) reassurance of worth, 2) reliable alliance, 3) guidance, 4)

attachment, 5) social integration, and 6) opportunity for nurturance. The Black Butterflyz intervention specifically targeted exercise specific social support along with subscale 1-reassurance of worth and subscale 6-opportunity for nurturance. Responses for each item ranged from “Not at all” = 1 to “Always” = 4. For each subscale, the higher the sum score (range=4-24), the stronger the participant’s social ties, while a lower score represented loneliness (Cutrona & Russel, 1986). Internal consistency of both subscales was poor at baseline (reassurance of worth $\alpha=.45$; opportunity for nurturance $\alpha=.50$), but adequate at post-intervention (reassurance of worth $\alpha=.78$; opportunity for nurturance $\alpha=.72$).

Cultural Leveraging and Recreational Activity Scale (CLARAS)

I developed the Cultural Leveraging and Recreational Activity scale specifically for the Black Butterflyz intervention in order to understand the associations between physical activity and the seven principles of Kwanzaa. This seven-item scale was assessed on a 5-point Likert scale ranging from “Strongly disagree” = 1 to “Strongly agree” = 5.

Figure 2. Cultural Leveraging and Recreational Activity Scale Questionnaire

Kwanzaa is a cultural celebration that honors African American heritage, families and communities. The following questions aim to understand the cultural significance of Kwanzaa Principles and its relationship to physical activity engagement for African American women.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	I prefer not to answer
1. The Day 1 Principle, Unity, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The Day 2 Principle, Self Determination, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The Day 3 Principle, Collective Work and Responsibility, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The Day 4 Principle, Cooperative Economics, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The Day 5 Principle, Purpose, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The Day 6 Principle, Creativity, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The Day 7 Principle, Faith, is a driving force behind why I engage in physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Positive and Negative Affect Schedule (PANAS)

The Positive and Negative Affect Schedule (PANAS) is a self-report questionnaire that consists of two 10-item scales to measure both positive and negative affect. Each item is rated on a 5-point scale of “Not at all” = 1 to “Very much” = 5. The measure has been used mainly as a

research tool in group studies but can be utilized within clinical and non-clinical populations as well (Crawford & Henry, 2004). Internal consistency was excellent at both time points for the positive affect subscale (baseline $\alpha=.92$; post-intervention $\alpha=.94$) and was adequate for the negative affect subscale (baseline $\alpha=.71$; post-intervention $\alpha=.90$).

Data Analysis

For outcomes that were normally distributed, paired t-tests were conducted to test for changes from baseline to post-intervention. Due to the majority of the physical activity outcomes being skewed, Non-parametric Wilcoxon Signed-Ranks Tests were used to test for changes in physical activity. Independent samples t-tests were conducted to examine whether participants who completed the study (i.e., completed both the baseline and post-intervention assessment protocols) differed significantly from those who dropped out (i.e., those who did not complete the post-intervention assessment protocols) on baseline or demographic characteristics. And, Pearson correlation analyses were conducted to test for correlations between changes in physical activity and changes in the primary variables of autonomy, social support, relatedness, and mood, where change scores were calculated by subtracting the baseline value from the post-intervention value. Google Analytics were performed on the Black Butterflyz website to determine pageviews during Phase I.

Chapter 4 - Results

Demographics

A total of 94 participants enrolled in the study. Demographic characteristics of the sample at baseline are reported in Table 3. The average age of the Black Butterflyz participants was 50.6 years old (SD=7.1). Nearly 90% of the participants had some college experience. Of the participants employed, 72% of the participants worked 35 hours or greater per week with half of the participants making greater than \$45,000 per year. The relationship status of the participants reflected a higher percentage of single women and divorcees. Single and divorced participants made up 52.2% of the population followed by 45.8% reporting being married or with a partner.

Table 3. Black Butterflyz Demographic Profile

	Frequency (Percent)
Current Employment Status	
Full time (working at least 35 hours per week)	68 (72.3)
Part time (working less than 35 hours per week)	8 (8.5)
Unemployed	2 (2.1)
Income	
< \$30,000	13 (13.9)
\$30,000 - \$59,999	32 (34)
>\$60,000	33 (35.1)
Prefer not to answer	16 (17)
Education	
High school graduate	10 (10.6)
Some college	35 (37.2)
College graduate	27 (28.7)
Masters or Ph.D.	21 (22.3)
Marital Status	
Significant other/married	43 (45.8)
Single	22 (23.4)
Divorced/separated	26 (27.7)

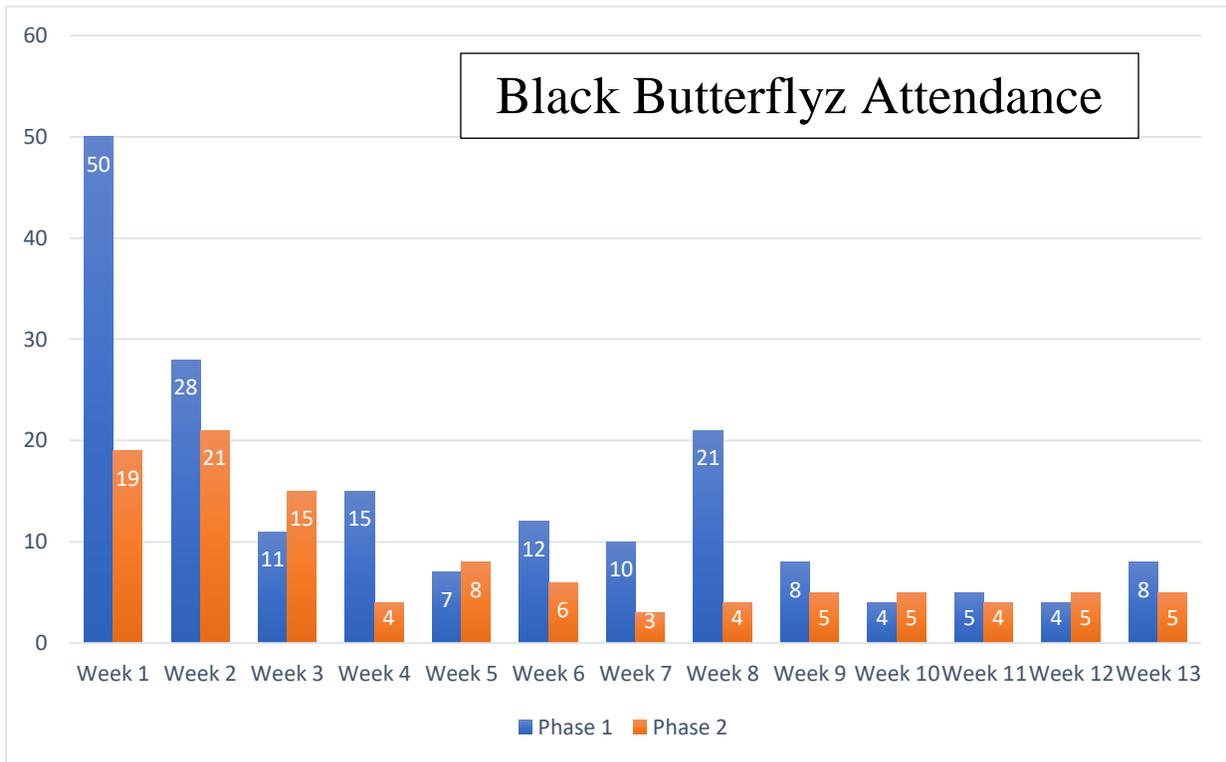
Participant Retention and Engagement

Out of the 94 participants who enrolled in the study, 45 (48%) completed the post-intervention measures. Completers were more likely to be employed ($\chi^2(5, N=94) = 12.9, p=.02$) and younger than those who dropped out ($t(92) = -2.8, p=.006$) with a mean age of 48.6 (SD=6.8) among completers compared to 52.6 (SD=6.9) years of age among dropouts. There were no other significant baseline or demographic differences between completers and dropouts.

Black Butterflyz Attendance and Google Analytics

Figure 3 shows the number of participants who attended the weekly walks during Phase I and Phase II. During the Phase I walks, there were 50 participants who attended at least one session. There was an average of 10 attendees per session (Appendix B). Additionally, there were 3,064 Pageviews during Phase I of Black Butterflyz. The average session time was 1.59 minutes (Appendix C). Phase II walks reflected 21 participants who attended at least one session (Appendix D). The Black Butterflyz enhancement options averaged 33 participants for the biometric screenings, 14 participants for the lunch and learn, 7 for both the mural painting and yoga classes, and 5 participants for the community bike rides.

Figure 3. Black Butterflyz Attendance



Physical Activity Specific Effects

Table 4 presents the baseline and post-intervention median values, and the p-values based on the Wilcoxin Signed-Rank Tests for the IPAQ self-reported physical activity data among completers ($n=45$). Analyses showed a significant increase in leisure time walking ($Z=-2.7$, $p=.007$) with a median addition of 104 minutes of walking each week, an increase in moderate intensity leisure-time physical activity ($Z=-2.3$, $p=.020$), and an increase in total leisure time physical activity ($Z=-2.7$, $p=.006$). The reported increase in physical activity supports Hypothesis 1-Black women will engage in increased levels of physical activity after participation in a culturally-tailored intervention. On the other hand, there was not a significant increase in total physical activity or in any of the other physical activity domains.

Table 4. International Physical Activity Questionnaire Specific Effects

Physical Activity (IPAQ-Long)	Baseline MET Minutes/wk. (Median) (n=45)	Post-intervention MET minutes/wk. (median) (n=45)	P-Value
Job-related physical activity	480	1935	.550
Transportation physical activity	165	198	.922
Housework, House maintenance, and Caring for Family	720	780	.635
Recreation, Sport and Leisure-time Physical Activity	198	792	.006
Moderate Intensity Leisure Time Physical Activity	0	0	.020
Vigorous Intensity Leisure Time Physical Activity	0	0	.066
Leisure Time Walking	99	264	.007
Total Physical activity Minutes Per Week	3,162	4987.5	.106

Table 5 shows the distribution of leisure time physical activity in minutes among the subsample of completers ($n=45$) at baseline and post intervention. These data demonstrate that although the median values for moderate- and vigorous-intensity leisure-time physical activity remained at 0 at both time points, there was a 25% decrease in the number of participants reporting “no-physical activity” between baseline and post intervention. Specifically, there was a favorable decrease from 38 of 45 participants reporting no moderate-intensity leisure-time physical activity at baseline compared to 29 of 45 at follow-up. Additionally, there were 36 of 45 participants reporting no vigorous-intensity leisure time physical activity at baseline compared to 27 of 45 at post intervention. The number of participants engaging in >150 minutes per week of leisure-time walking also increased from 7 at baseline to 17 at follow-up.

Table 5. Physical activity minutes calculated from the International Physical Activity Questionnaire

	0 min./wk.	1-49 min./wk.	50-99 min./wk.	100-149 min./wk.	>150 min./wk.
Leisure time walking					
Baseline (n=45)	22	4	12	0	7
Post intervention (n=45)	15	4	5	4	17
Moderate-intensity leisure time physical activity					
Baseline (n=45)	38	2	3	1	1
Post intervention (n=45)	29	3	8	2	3
Vigorous-intensity leisure time physical activity					
Baseline (n=45)	36	3	0	0	6
Post intervention (n=45)	27	2	8	1	7

Intervention Effects on Kujima Constructs

Among the 45 participants who completed the post-intervention measures, the Black Butterflyz study demonstrated a statistically significant increase in exercise-specific social support from friends ($t(44) = -3.13, p=.003$), as shown in Table 6, which supports Hypothesis 2 – Black women thrive in settings where social support is exchanged; therefore, exercise-specific social support will increase as a result of participation in a culturally-tailored physical activity intervention. However, the secondary construct of the Kujima Model, Autonomy, did not show a significant increase from baseline to post-intervention ($t(44) = -.92, p=.36$). This finding disproves Hypothesis 3-Of the seven Kwanzaa principles, Kujichagulia (Self Determination), which served as the cultural equivalent to Autonomy, would show the largest increase after participation in a culturally tailored physical-activity intervention. The remaining constructs, positive and negative affect, opportunity to provide nurturance, and reassurance of worth failed to show a significant change (Table 6).

Results of the Pearson correlational analyses revealed that changes in overall leisure-time physical activity were positively associated with changes in positive affect ($r=0.31, p=0.04$). There were no significant associations between changes in leisure-time physical activity and changes in exercise-specific social support ($r= -.12, p= .42$), opportunity for nurturance ($r=-0.23, p=0.13$), reassurance of worth ($r=-0.27, p=0.07$), or autonomy ($r= -.24, p=.11$).

Table 6. Kujima Model Constructs

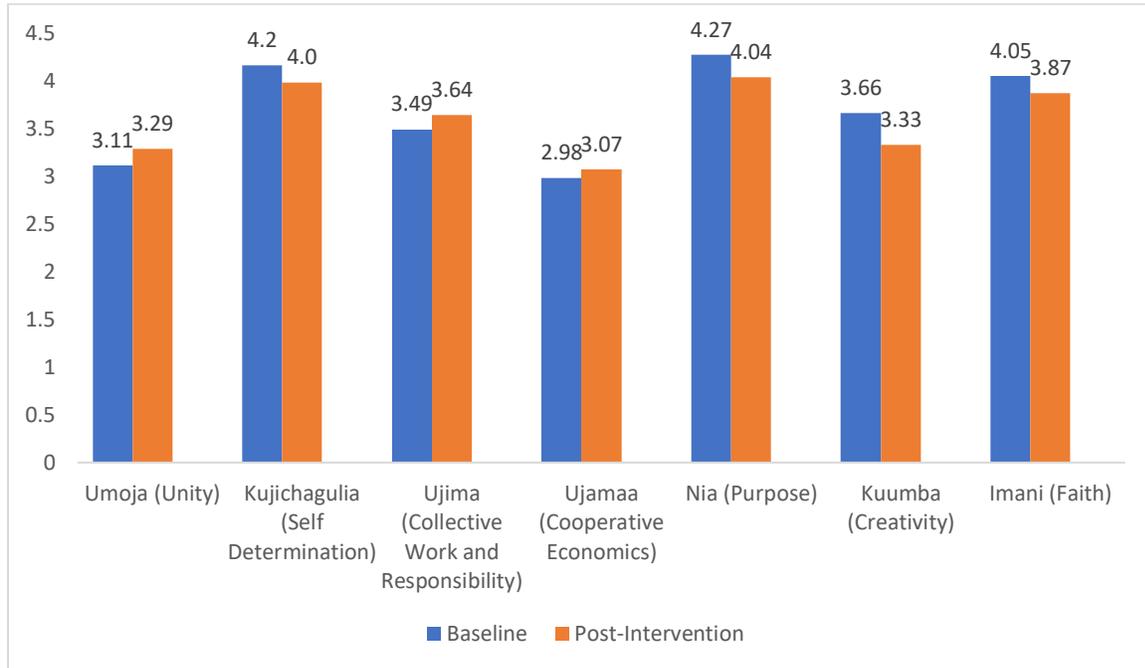
	Baseline (Mean/SD)	Post-intervention (Mean/SD)	P-value
Treatment Self-Regulation Questionnaire (Autonomy) Relative Autonomy Index	3.0 (1.7)	3.2 (1.3)	.36
Positive and Negative Affect Schedule (Mood)			
Positive Affect	37.8 (8.4)	37.5 (9.1)	.681
Negative Affect	15.3 (4.2)	16.5 (7.1)	.277
Social Provisions Scale (Social Support)			
Reassurance of Worth	4.5 (.53)	4.4 (.66)	.168
Opportunity to provide nurturance	4.2(.64)	4.3 (.71)	.290
Social Support for Exercise (from Friends)	23.7 (11.0)	28.2 (9.3)	.003

CLARAS Analysis

CLARAS, Cultural Leveraging And Recreational Activity Scale, was developed as an attempt to understand the relationship between physical activity and the seven principles of Kwanzaa. Only one of the three primary Kujima Model Constructs, Autonomy, ranked among the top two principles related to physical activity (mean = 4.2 [sd=1.0] at baseline and mean = 4.0 [sd=1.1] post intervention). Autonomy is the equivalent of the Kwanzaa principle of Kujichagulia which means Self Determination. The highest ranked principle, which was not identified as one of the key Kujima Model constructs, was Nia (mean = 4.3 [sd=1.0] at baseline

and mean = 4.0 [sd=1.2] post intervention). Nia means Purpose. Figure 4 reflects a relatively constant scoring among each identified principle.

Figure 4. Cultural Leveraging And Recreational Activity Scale Results



Focus Group Responses

During the Black Butterflyz’ lunch and learn focus group, I asked open-ended questions focused on key Kujima Model principles- Collective Work and Responsibility along with Autonomy.

The first question, “What do you need from your sisters to be successful during this next journey?” was met with a great deal of uniformity in answers. Two central themes emerged from this question. Theme one supports a need for acknowledgment for their efforts. Participants’ responses included, “I need positive reinforcement” and “I need verbal praise.” Theme two supports to abundance of research surrounding Black women’s need for social support. Three of

the responses included, I need “opportunities for bonding,” “accountability,” and “in-person interaction.”

The second question was related to Autonomy; “What motivates YOU to stay engaged during this next journey?” The answers to this question ranged from “self-interest and results,” “mindset,” “to keep walking every day to get my 30 minutes,” and “a calendar of events.”

Autonomous motivation is very individualized as seen by the previous answers; but the last answer also speaks to the first question related to Collective Work and Responsibility- “I need to surround myself with other Black women to encourage health and enjoy small steps of achievement.”

Chapter 5 - Discussion

The purpose of this study was to design a culturally-relevant, evidence-based intervention to improve the health and wellbeing of Black women while exploring the intersection of autonomy, social support, and physical activity among this underserved population. This study was intentionally designed to model a “FUBU,” For Us By Us, approach to physical activity promotion. The intervention was designed by a Black woman for Black women and the walk leaders were Black women, too.

This unapologetic approach to improving the health outcomes of Black women resulted in three significant areas of improvement for those who completed the 26-week intervention: 1) an increase in leisure-time physical activity, including leisure-time walking and moderate intensity leisure-time activity, 2) an increase in exercise specific social support from friends, and 3) a positive relationship between increases in physical activity and increases in mood.

Walking

Culturally-tailored interventions such as Black Butterflyz, the Deep South Network WALK (Lisovicz et al., 2006), and the Women’s Walking Program (Ingram et al., 2011) all have several things in common, one of which is knowing that walking is one of the answers to getting Black women more active. The Black Butterflyz intervention confirmed this common knowing through the significant, average weekly increase of an additional 105 minutes of physical activity for the 45 completers. At the core of Black Butterflyz’s constructs, walking served as a form of Collective Autonomy-an activity that can be performed by oneself but in the company of others.

Walking and Implications for Future Studies

The power of Collective Autonomy was observed in the increased attendance spikes of Black Butterflyz during the Go Red for Women Walk in February (Week 2, Phase I) and the St. Patty's Day walk in March (Week 8, Phase I). These two events represented a communal connection to a greater cause or a special community event; one that benefited others over self. Furthermore, the increased attendance during these two sessions also supports the unexpected finding related to "purpose," identified on the CLARAS Scale as a driving factor for physical activity. Without fully knowing how participants defined purpose, a possible definition, based off this example, could be "*to be of service for a greater cause.*" Being of service can result in an increase in hope and flourishing (Ginwright, 2011) and the Black Butterflyz study did identify a correlation between increased levels of physical activity and mood.

Future studies could benefit from this discovery by developing physical activity interventions that focus less on weight loss and more on purpose-driven strategies that involve community engagement. With this stealth approach to programming, Ethics of Care could conceivably be viewed as a facilitator for physical activity among Black women while building upon social movement motivations such as social and collective identity, collective efficacy, and the exchange of personal responsibility for collective responsibility (Polletta & Jasper, 2001).

Social Support

Being a kinship population of people, Black women tend to value the importance of community, the impact that social support has on physical activity comes as no surprise. As evidenced by the Black Butterflyz intervention and supported by previous research, reported

levels of increased physical activity engagement are associated with a greater amount of social support from friends who encourage their efforts (Peterson, Yates, & Hertzog, 2008).

Furthermore, research adds that encouraging participants to engage in physical activity with friends and family can be enhanced by the addition of helping them find ways to incorporate goal setting strategies to promote long-term physical activity (Kirchhoff et al., 2008).

Social support is not a perfect facilitator; for, without it, social support can serve as a barrier to physical activity. During private conversations, I heard participants say, “Nobody in my family exercises; therefore, there is no one to keep me accountable” and “If I had someone with me, I would be more likely to get out and do something.” There are a plethora of challenges surrounding ways to avoid physical activity; therefore, a new proposal to address the issue of social support is to train Black women to become group exercise instructors so they may lead classes to target other Black women.

Social Support and Implications for Future Studies

Due to the significant findings related to social support among Black women, there exists a need to motivate and train Black women to become exercise instructors. A trained corps of Black female exercise instructors could be a revolutionary and cultural approach to addressing health disparities while simultaneously addressing the barriers pertaining to the lack of African American female role models and lack of social support. By seeking out encouragement and accountability (Joseph, Ainsworth et al., 2017 from both the participant and the instructor, Black women can inspire one another to engage in physical activity while building social connectedness.

Social Connectedness

Clothing and physical activity are typically not associated with each other unless it is in relationship to workout gear. However, the key significance of the relevance of FUBU, an urban hip hop clothing line, is in its acronym-For Us By Us. The FUBU slogan was made popular in the early 90s by the African American designer, Founder, President, and CEO, Daymond John. Twenty-six years post the launch of FUBU, the Black Butterflyz intervention made a bold decision to publicly and unapologetically improve the health and wellbeing of Black women in a similar fashion through the creation of an intervention that was designed *for us by us*.

Relatedness is often a term that is interchanged with the word “social connectedness.” The Black Butterflyz intervention identified relatedness as a key component of this and any future culturally-tailored interventions. Participants and program developers with a similar ethnic/racial and gender orientation serve as a phenomenal opportunity to overcome a potential barrier to physical activity engagement (Joseph, Ainsworth et al., 2015).

The Black Butterflyz’ lead researcher was a Black woman, the certified walk leaders were Black women, and the participants were Black women; all of which supported the success of the intervention and the subsequent significant reported increases in both leisure time walking and moderate intensity leisure-time physical activity.

Social Connectedness and Implications for Future Studies

Social connectedness goes beyond the physical and verbal interactions of two or more people; participants can also feel a sense of connection from the very branding of the program intervention. As previously mentioned, there is an over saturation, in the media, of White faces associated with positive health, physical activity, and happiness. A lack of positive representation creates an inability for Black women to see themselves as an active participant in their own health journeys. Kreuter and colleagues (2003) along with Joseph, Keller et al., (2017) identified visual appeal and program packaging as cultural considerations when designing programs. Black Butterflyz intentionally branded this program with a silhouette of a Black woman, complete with an afro and a thick frame, to help participants feel connected to the program. It would behoove future interventions to factor in cultural marketing images when designing programs targeting this specific population.

Retention

As previously mentioned, African American women rank lowest among both sex and race demographic groups to achieve the recommended levels of physical activity (Joseph, Ainsworth et al., 2015). This ranking poses a significant problem when addressing this key modifiable risk factor associated with major chronic diseases—cancer, heart disease, diabetes, and obesity. Of equal concern, beyond recruiting Black women to engage in physical activity, is the issue of retaining them. The Black Butterflyz study had a low retention rate (48%) and, as a result, identified potential complexities related to this subject.

An initial hypothesis related to the limited retention rate is the idea of excess opportunities. People tend to like options, but sometimes too many options are paralyzing and result in inaction. Phase I was fresh, vibrant, and manageable with weekly walks, but Phase II offered walking options on most days of the week. This over saturation could have served as a detriment to the program. Just like the demise of the FUBU brand, Daymond John, FUBU Founder, President, CEO and Author of “The Brand Within” explained that one of the major factors that led to the company’s demise is that they had too much product. “Once you hit mark-down bins, it’s tough to climb out, because you’ve lost the sense that your clothes are fresh and vibrant,” he writes (Banks, 2015).

In retrospect, the duration of the intervention was a potential contributor to the less than 50% retention rate. This 26-week walking intervention spanned across three seasons with a mix of weather extremes during this six-month timeframe. Upon further comparison of other physical activity interventions targeting Black women, 26-weeks was comparable to several six-month studies (Bland & Sharma, 2017). Although reducing the time of the commitment could have improved the retention rate, it could have potentially negated the long-term goal of improving the health-related quality of life of Black women. Additionally, other walking interventions of greater duration have yielded higher retention rates. The Deep South Network (DSN) was one such intervention.

Ten years prior to the launch of Black Butterflyz, the DSN Walk set out to improve the health and wellbeing of Black women through a walking intervention in 22 counties in the Deep South. The DSN intervention was 30 months and had over 100 times the number of Black Butterflyz

participants. Retention rates varied between 24% and 96% in the rural sites, but of the comprehensive participant pool of 1322 Black women, the six-month retention rate was 78% (Baskin, et al., 2011). The key strategy used by the Deep South Network Walk, that was missed by Black Butterflyz, was the broad use of community engagement to inform the development, implementation, and evaluation of the intervention.

Although Black Butterflyz was informed by the findings in literature reviews and formative focus groups, this intervention was exclusively designed by one person and led by six volunteers during Phase II. If the DSN model was followed, Black Butterflyz would have involved more stakeholders who were committed to making Black women's health a capital concern. The stakeholders would have served as a strong social support network that provided regular check-ins with their pre-identified group, encouraged goal setting, and kept a log of daily steps to keep participants engaged.

Retention and Implications for Future Studies

In order to address the issue of retention, social media and mobile-health strategies would serve as a great complement to future interventions. Black Butterflyz experienced a 48% retention rate and this could be partly attributed to the technological and financial difficulties associated the texting component of the intervention. Unfortunately, within two weeks of the launch of Black Butterflyz, the texting service that was being used for the intervention was sold to another company. The new company raised their prices by 1400% and did not fully transfer the originally programmed messages, so this part of the intervention was not able to be implemented as intended.

Aside from the texting, very few participants utilized the private Facebook group to highlight their daily physical activity successes or offer a brief comment or supportive emoji. These two components served as a missed opportunity. In the future, it is highly recommended to utilize pre-existing apps that people already have familiarity with rather than relying on a fee-based texting service such as the one used by Black Butterflyz. In retrospect, this service had limited experience executing the demands of sending messages of motivation via text, tracking participants' steps, developing spreadsheets, and submitting weekly reports.

Kujima Model

Typically, most behavior change interventions that are designed to target “vulnerable populations,” are in essence targeting populations of color. Albeit possible that the term “vulnerable” can refer to low income, disabled, and/or rural communities, the key difference here is the cultural linkages. The cultural oversight exhibited by the very limited number of ethnic/racial behavior change theories served as a missed opportunity that Kujima Model set out to change. To my knowledge there are no Afrocentric theories based upon the principles of Kwanzaa.

Kujima Model and Implications for Future Studies

As a way to honor the African ethical imperative of *serudj ta*, “to constantly reimagine, renew, and remake the world,” the Kujima Model did just that. Even if that “world” consisted of a slither of a percentage of a population in a state where the Black female population is barely 5%, your “world” matters and the health of Black women across the world matter. Future studies focused on Black women and behavior change should strive to incorporate principles that carry a cultural significance. All things considered, the terms *unity*, *self-determination*, *collective work*

and responsibility, cooperative economics, purpose, creativity, and faith are all universally applicable terms; however, just the mention of Kwanzaa brings about a cultural pride to some “vulnerable” populations... correction, “VALUABLE” populations.

The Cultural Leveraging and Recreational Scale was developed to test this new model of change and one of the seven principles consistently ranked highest at baseline and post intervention-Nia (Purpose). This finding was unexpected, as the Kujima model focused primarily on Kujichagulia (Self Determination) and Ujima (Collective Work and Responsibility). Future studies should seek to explore two key concepts when utilizing the Kujima Model-1) Black women’s acceptance and perception of Kwanzaa and 2) how Black women define each of the seven principles of Kwanzaa.

Without knowing Black women’s internalized definitions of each principle, it is difficult to assess the level of importance of each word. Future interventions should take care to include aspects of the key model constructs (Autonomy, Relatedness, and Social Support) while also emphasizing Purpose.

Conclusions

Physical inactivity is a major public health concern. Additionally, addressing this modifiable risk factor also covertly addresses the health disparities that disproportionately impact Black women. Lack of physical activity has been proven to lead to obesity, increased risk of certain cancers, heart disease, hypertension, and obesity, all chronic diseases that are killing Black women at a faster rate than their White counterparts. One strategy to address this epidemic

is to design culturally-relevant, evidence-based, physical activity interventions. These interventions should be informed by both theory and voices of the target population.

Black women are capable of engaging in physical activity. Black women want to engage in physical activity. However, Black women want to know and feel that the physical activity experience was designed like FUBU, *For Us By Us*. Despite the limitations of the Black Butterflyz study, the intervention did show two major successes-an increase in exercise-specific social support and an increase in leisure time physical activity; these were the main goals Black Butterflyz set out to achieve.

Just like an actual butterfly, Black Butterflyz will go through a metamorphosis cycle and evolve from a physical activity intervention into a community-based participatory experience that dons the name the Kujima Collective. The Kujima Collective will engage in community mobilization efforts that have a singular goal of making Black women's health a capital concern. Future and interventions will exclusively focus on addressing five key health disparities that identify physical inactivity as a key modifiable risk factor-cancer, diabetes, hypertension, kidney disease, and obesity.

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Appendix A - L.I.F.T. Script

Motivational Interviewing Script

	A	B	C
1		Lead with the understanding of MI and explain that you will ask four exploratory questions based off the mission and vision of BB - L.I.F.T Ask permission to proceed.	
2	Permission Granted		Permission granted with provisions.
3	<p>MI is a guided conversation where you are the expert on you. I am not a therapist or a counselor. I am simply a reflective guide or I like to think of it as a “dance partner” who is here to help you set and achieve realistic goals to improve your overall health and wellbeing. * (INSERT) <i>My credentials are that I am a certified Behavioral Change Specialist and Lifestyle Wellness Coach.</i></p> <p>If you are okay with proceeding, this guided goal setting session will take no more than 30 minutes and I will be taking notes along the way. Are you okay with that?</p> <p>Excellent, let’s proceed.</p>		
4		<p>Start by Raising the Issue and listening for Change Talk - Are you ready to become more PA?</p> <ul style="list-style-type: none"> • If yes, proceed to A5 • If no, say thank you for your time and if that were to ever change, feel comfortable reaching out.. 	
5	The first question follow the L - Learning to make health a priority. “One of the best things		

	we can do to stay healthy is to be active. How physically active do you think you are?"		
		Await and record answer	
5b	In the past week, how many days have you been physically active for a total of 30 minutes or more? Does this add up to 150 minutes?	Await and record	
5c		Ask permission to provide feedback. If granted, follow B5d.	
5d		<p>From what you told me you are</p> <ul style="list-style-type: none"> • (A5e) getting the recommended amount of PA each week • (C5e) not as active as you would like to reach your goals. <p>National guidelines recommend that we are active for at least 150 minutes per week, which is the equivalent to being active for 30 minutes most day of the weeks.</p> <p>Being more PA can help improve your sleep, make you feel more energized and more socialized, improve your health and wellbeing, help you maintain a healthy weight and much more.</p>	
5e		Ask permission to share a few thoughts PROCEED TO A5f or C5f	
5f	If yes: Positive reinforcement and ask her to think about goals over the next 13 weeks. (Remind her that you are recording these goals and will text them to her periodically throughout the intervention)		If no: Positive framing. *If any amount of PA was completed, congratulate her! Discuss goals to increase PA in the upcoming week. (Remind her that you are recording the goals to be sent to her via text.)
6		<p>Ask if there is anything else to be explored in the "L." If not, inform and ask permission to proceed to the next question - I.</p> <p>"Is it important to inspire other Black women to make health a priority?"</p>	

6a	<p>If yes: What do you think are simple ways to go about inspiring another Black woman?</p> <p>(*remind her that you are recording these answers)</p>		<p>If no: Say thank you for considering this topic and let's proceed to the next one. - F Forging your own path to health and wellbeing</p>
7		<p>Ask if there is anything else to add to the "inspiration" list. If nothing, ask permission to proceed to the next question. -</p> <p>How do you define PA and make it apply to you personally?</p>	
7a	<p>If certain: Explore all answers by following with "tell me more," "what does that mean to you," etc.</p> <ul style="list-style-type: none"> • Adopt a person-centered approach • Explore common barriers • What types of PA do you enjoy? And do you think you could do more of it. • How important is increasing PA to you? 		<p>If ambivalent:</p> <p>Build her understanding of the effects of inactivity and the benefits of being for PA by doing things she enjoys. Identify what is meaningful to her? Identify the pros and cons.</p>
8		<p>Ask if there is anything else to be discussed regarding "Forging." If not, ask permission to proceed the fourth and final topic - T - Transforming the environment to make health happen.</p>	
8a	<p>If permission granted, explaining what "environment" means and then ask the following question:</p> <p>Black Butterflyz looks at the environment as any surrounding such as home, work, school, synagogue, church, etc. that has the ability to shape you. Conversely, BB also believes that you have the ability to shape your environment(s).</p>		<p>If permission not granted proceed to B9.</p>

	Let's explore ways to change your environments to help you to become successful with reaching your goals.		
9		Ask if there is anything to add to the environment conversation. If not, ask permission to summarize.	
9a	If granted Summarize L-I-F-T- Inform her that she can schedule additional MI sessions, if interested.		If not granted, Remind her that she can discontinue participation at any time.

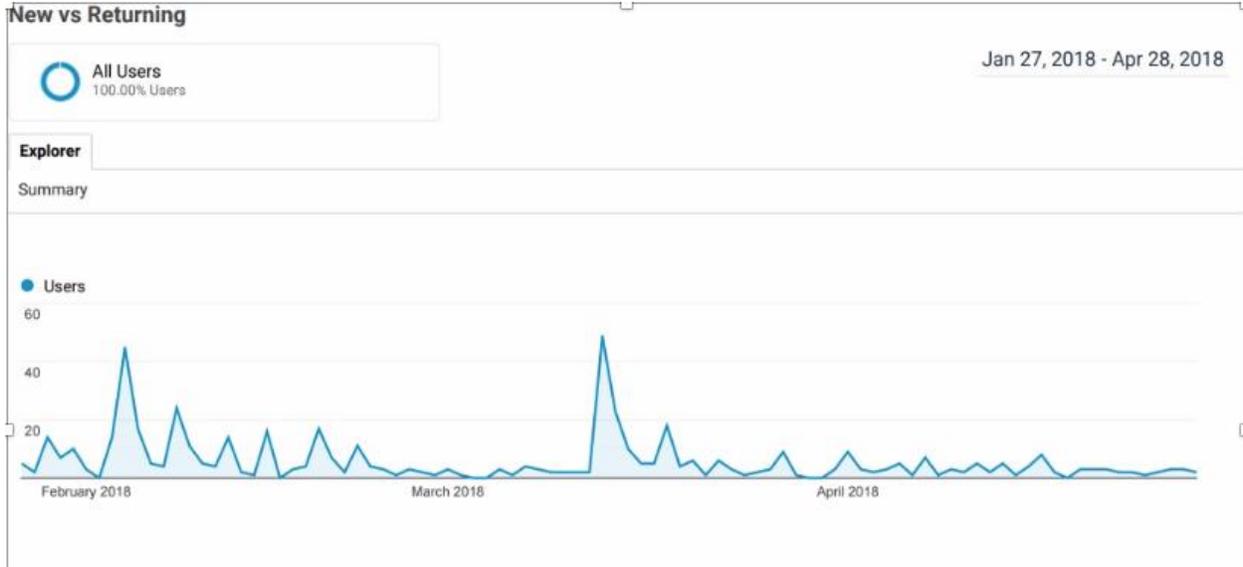
Appendix B - Phase I Attendance

Phase I Weekly Attendance

2/3	2/10	2/17	2/24
28 attendees	11 attendees	15 attendees	7 attendees
3/3	3/10	3/17	3/24
12 attendees	10 attendees	21 attendees	8 attendees
3/31	4/7	4/14	4/21
4 attendees	5 attendees	4 attendees	8 attendees

Appendix C - Google Analytics

Black Butterflyz Website Usage



Analytics Black Butterflyz 2018
All Web Site Data

[Go to report](#)

Engagement

All Users
100.00% Users (100.00% Sessions)

Jan 27, 2018 - Apr 28, 2018

Distribution

Session Duration

Sessions

580

% of Total: 100.00% (580)

Pageviews

3,064

% of Total: 100.00% (3,064)

Session Duration	Sessions	Pageviews
0-10 seconds	382	724
11-30 seconds	25	110
31-60 seconds	29	174
61-180 seconds	51	499
181-600 seconds	58	991
601-1800 seconds	32	478
1801+ seconds	3	88

Appendix D - Phase II Attendance

Phase II Daily Site Attendance

	Mondays (Capitol Building)	Tuesdays (am) (Washburn University)	Thursday (Water Walking)	Saturday am (Bark Park)	Weekly Totals
Week 1	2	4	9	4	19
Week 2	10	3	7	1	21
Week 3	1	2	10	2	15
Week 4	2	2	cancelled	cancelled	4
Week 5	4	3	cancelled	1	8
Week 6	1	3	1	1	6
Week 7	1	1	cancelled	1	3
Week 8	cancelled	2	1	1	4
Week 9	1	2	1	1	5
Week 10	1	2	1	1	5
Week 11	1	1	1	1	4
Week 12	1	2	1	1	5
Week 13	1	2	1	1	5