

FAITH-BASED MOTIVATION FOR HEALTH BEHAVIOUR CHANGE:
A PILOT OF THE DANIEL PLAN IN A SMALL, RURAL ALASKAN COMMUNITY

By

Anna J. Williams, BSN

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APPROVED:

Cynthia Montgomery, PhD, MSN, ANP, FNP-BC, PMHNP-BC, Committee Chair
Michelle Burdette-Taylor, PhD, MSN, RN-BC, CWCN, CFCN Committee Member

Barbara Berner, EdD, Director
School of Nursing
William Hogan, MSW, Dean
College of Health

Abstract

Motivating patients to make beneficial lifestyle changes such as improved diet and exercise habits is a challenging but important role for Nurse Practitioners. This project addressed this problem by exploring one promising method for motivating patients, that of faith-based interventions. The Daniel Plan, a previously successful faith-based, six-week small group study was implemented in a small, rural Alaskan community. Data collection included biometric measurements and self-report questionnaires on nutrition and physical activity. All those who completed the study lost weight and improved their diet and exercise habits. Participants reported that the group setting and the spiritual focus were most effective in facilitating their positive changes. These results support previous evidence that faith-based wellness interventions should be considered as a valuable tool for facilitating health behavior changes. They also indicate the importance of incorporating spirituality assessments into the care of patients as a potential way of motivating them to make such changes. More specifically, this project identified that the Daniel Plan was an effective program to recommend to those patients who identify with Biblical teachings.

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**Faith-Based Motivation for Health Behavior Change:
A Pilot of the Daniel Plan in a Small, Rural Alaskan Community**

Despite the technological and pharmaceutical advances of modern medicine, the day-to-day decisions individuals make about what to eat and how much physical activity to engage in are some of the most crucial determinants of their health. Americans are constantly tempted with cheap, efficient, highly-processed foods that are high in calories and low in nutrition. Many are also challenged to find the time and motivation to be physically active (Center for Disease Control and Prevention [CDC], 2015e).

Faith-based wellness interventions have provided a creative and holistic way to address this behavior change challenge and work towards a deep-seated intrinsic motivation to live healthier lives. Faith-based wellness interventions have incorporated Biblically-based spiritual or religious concepts in their delivery (DeHaven et al., 2004). Participants of such programs have reported that the spiritual elements were key to motivating them to make changes (Gutierrez et al, 2014; Kim et al., 2008; Reicks, Mills, & Henry, 2004). Participants have described how a respect and love for God motivated them and how the “atmosphere of forgiveness and grace” in the group settings helped them keep working at changes even when they seemed too hard or they had failed (Seale et al, 2013, p. 163).

This project was done as a pilot to evaluate one specific faith-based wellness intervention, the Daniel Plan. The Daniel Plan is a six-week, small group study that includes a book, study guide and DVD teaching sessions. It has had media reports of success, but no results were found in the peer-reviewed literature.

Background and Significance

In Healthy People 2020, the United States Department of Health and Human Services (USDHHS) presented the combined focus on nutrition, physical activity, and obesity as a leading health indicator (2014). The United States' poor eating habits and lack of physical activity have led to a national obesity epidemic that overflows into a host of debilitating chronic health conditions such as heart disease, hypertension, diabetes, osteoarthritis, stroke and some cancers (CDC, 2015a; USDHHS, 2014). Heart disease has been the number one killer in the United States, accounting for 25% of all deaths; poor lifestyle behaviors have been the most significant contributors to this deadly disease (CDC, 2015d). Since the year 2000, worldwide deaths from chronic diseases have surpassed those from infectious diseases; by 2012, 68% of deaths were due to chronic diseases (World Health Organization [WHO], 2016). Scientific evidence has long shown that a healthier diet and regular exercise leads to a longer and healthier life. Rigorous studies from almost 20 years ago proved that intensive lifestyle changes can prevent, and even reverse, heart disease, not to mention a long list of other chronic diseases (Ornish et al., 1998).

Despite the clear evidence, most Americans have struggled to make these changes. A survey by the National Institute of Health (NIH) found that 69% of Americans over the age of 20 were overweight, and 35% were obese (2012). Only 13.1% of Americans met the recommended amount of fruit and only 8.9% met the vegetable recommendations (Moore & Thompson, 2015). A recent CDC survey indicated that only 49.2% of adults over age 18 met aerobic activity guidelines, and only 20.8% met strength training recommendations (CDC, 2015c).

The evidence has been clear that most individuals have been making poor health-related lifestyle choices. Repeated documentation in the literature has shown that simply telling patients what they need to do to be healthier is not effective (Clark & Janevic, 2013). Motivation has

been needed, not just education. Missed treatments were common; there were large numbers of dropouts from weight loss programs and smoking cessation programs have had very low success rates (Clark & Janevic, 2013). Healthy People 2020 explained that it was not simply people making bad choices, but that there have been a number of barriers - environmental, financial, physical and cultural - that have made it very difficult for many to have made the necessary changes (USDHHS, 2014). For example, economical and easily accessible places to buy fresh fruits and vegetables, and safe and enjoyable places to exercise have been needed. These and other barriers must be addressed, but even in the perfect environment a personal motivation to consistently make the right choices is still necessary.

For individuals to be adequately motivated to make lasting health behavior changes intrinsic motivation has been necessary (Santos, Mata, Silva, Sardinha, & Teixeira, 2015). People have needed to have a “sense of ownership” (Teixeira, Patrick, & Mata, 2011, p. 102) and deeply value and identify with health goals so that they could “personally endorse their importance” (Ryan, Patrick, Deci, & Williams, 2008, p. 3). This kind of motivation has been most likely to lead to sustained behavior changes (Dalle Grave, Centis, Marzocchi, Ghoch, & Marchesini, 2013). Linking a person’s existing, deep-seated spiritual foundations with positive healthy behaviors has been one way to facilitate intrinsic motivation. The literature revealed that faith-based wellness interventions have been effective at increasing fruit and vegetable intake, increasing physical activity, and facilitating weight loss (Bopp, Peterson, & Webb, 2012; Gutierrez et al., 2014; Parker, Coles, Logan, & Davis, 2010).

Recent United States surveys have shown that the majority of Americans identify with Christian values. Seventy percent have described themselves as Christian (Pew Research Center, 2016), 86% expressed belief in God, 54% have been church members, 52% have believed that

“religion can answer all or most of today’s problems,” and 75% have agreed that if Americans were more religious that it would lead to positive changes (Gallup, Inc., 2016). Prayers for physical healing have been one of the most common religious expressions, with 78% to 87% reporting having prayed for the healing of themselves or others (Levin, 2016). Faith-based interventions will not appeal to everyone, but these survey results show that most Americans have expressed belief in God and 75% have agreed that Christianity is a positive social influence.

Purpose and Rationale

The purpose of the Daniel Plan pilot was to evaluate the effectiveness of one faith-based wellness intervention in a specific population and location. Results included quantitative data in the form of weight and waist circumference changes and self-reported dietary and physical activity measures. Participants also provided feedback about the effectiveness of the Daniel Plan and their general challenges and successes with attempting health-behavior changes during this program and in the past.

As discussed, there has been a clear need for most individuals to make health behaviour changes. The challenge has been to increase individuals’ intrinsic motivation so they are able to make sustainable lifestyle changes. This project evaluated the effectiveness of employing individuals’ spirituality in an effort to foster intrinsic motivation. Interventions such as the Daniel Plan provided a positive, supportive, social network and the emphasis on prayer and religious practices promoted psychological well-being (Campbell, et al., 2007; Gill, Minton, & Myers, 2010). It was hypothesized that this combination would provide a positive environment for participants to overcome barriers that may have seemed insurmountable in the past.

A nationwide survey of faith-leaders (n=844) revealed that the most commonly cited barriers for implementing health promotion within churches has been a lack of lay leadership

(48%) and a lack of finances (47%) (Bopp & Fallon, 2013). The Daniel Plan reduced these barriers because it was economical and could be purchased and implemented by any individual regardless of educational background.

This Daniel Plan pilot provided evidence of the efficacy of this particular program, and added to the literature on faith-based wellness interventions. Evidence has shown that diet and exercise habits are a matter of life and death. Nurse Practitioners and other health care providers must think outside the clinic, outside the traditional health care arena, to figure out ways that can motivate individuals to make consistent daily decisions that will decrease their burden of chronic disease and facilitate a better quality of life.

Clinical Questions

How can health care providers motivate patients to make better daily health behavior decisions? In the face of the United States obesity epidemic and rising rates of chronic diseases, every health care provider should be asking this question. This is the broad clinical question that inspired this project.

Specifically, this project asked if a health intervention grounded in Biblically-inspired faith teachings could be an effective way to achieve health behavior changes. To evaluate this, the following three questions guided the project:

1. Does the six-week Daniel Plan lead to weight loss?
2. Does the Daniel plan lead to decreased waist circumference?
3. Does the Daniel Plan lead to increased physical activity as measured by the Rapid Assessment of Physical Activity (RAPA) Questionnaire (University of Washington Health Promotion Research Center, 2006)?

4. Does the Daniel Plan lead to improved nutrition intake as measured by Food Screener Questionnaires (Block, Gillespie, Rosenbaum, & Jenson, 2000)?

The pre and post questionnaires also included three open-ended questions to explore each participant's perception of what did or did not work for achieving health behavior changes. This provided information that can be applied to office or community interventions as well as providing direction for future research.

Relevance to Best Practice

In the United States, half of all adults, 117 million people, have suffered from chronic diseases (CDC, 2016). Most patients providers have encountered would have benefitted from making lifestyle changes. Such changes would have decreased the risks and complications of obesity, cardiovascular disease, diabetes and other chronic diseases. Creative and non-traditional approaches to health are becoming more important as a greater percentage of sickness and mortality is caused by poor lifestyle choices. We must utilize any potential source of motivation for patients, and for some, spiritual beliefs may hold the most promise.

Part of a thorough patient health assessment has included their spirituality. Experts have argued that a spirituality assessment provides a valuable way to build rapport, reveals a potential form of coping and strength, and may increase patient compliance (Saguil & Phelps, 2012). The positive results of this project have revealed that spiritual beliefs are a promising source of intrinsic motivation for health behavior changes. With the awareness of how patients' faith and spirituality can spark autonomous motivation to change, health care providers can incorporate faith dimensions into motivational interviewing office interventions.

Literature Review

The following literature review has been organized into sections on the theoretical framework for the project, a discussion of multi-behavior interventions, and an overview of faith-based wellness intervention studies.

Theoretical Framework

The Self Determination Theory was developed by Richard Ryan and Edward Deci in 1985. They have described it as “a theory of motivation” that is “concerned with supporting our natural or intrinsic tendencies to behave in effective and healthy ways” (SDT, 2016). SDT has emphasized the crucial aspect of autonomous or intrinsic motivation and has been used effectively in a number of behavioral health areas including alcohol abuse, smoking cessation, weight loss, physical activity and diet (Deci & Ryan, 1985; SDT, 2016; Ng et al., 2012; Teixeira, Carraca, Markland, Silva, & Ryan, 2012). The three main concepts of the SDT are autonomy, relatedness and competence.

The literature has shown that SDT has been reflective of and complementary with other successful health behavior change concepts such as self-efficacy and motivational interviewing (Deci & Ryan, 2012; Jacobs, Hagger, Streuken, Bourdeaudhuij, & Claes, 2011; Patrick & Williams, 2012). This is noteworthy as self-efficacy has been a significant determinant of health behavior change (Dalle Grave, et al., 2013; Ovaskainen et al., 2015; Palmeira et al., 2007). The concept of self-efficacy, motivational interviewing, and autonomy as described by SDT are all rooted in the understanding that behavior changes must be internally motivated to become sustainable (Teixeira, Silva, Mata, Palmeira, & Markland, 2012).

Deci and Ryan (2012) explained that being autonomous “refers to acting with a sense of volition and the experience of willingness” (p. 2). When people are autonomously motivated

they “are more wholeheartedly engaged, persistent, and efficacious than when controlled in their motivations” (Deci & Ryan, 2012, p. 2). Autonomous motivation can take the form of “identified regulation,” which is seen when “one personally endorses or identifies with the value or importance of a behavior or health practice” (Ryan et al, 2008, p. 3). Or, better yet, “integrated regulation,” where “a person not only values a behavior, but has also aligned it with other central values and lifestyle patterns” (p. 3). This is in contrast to less effective forms of controlled motivation which are created by social pressures, the desire for a reward, or to please others. The SDT has argued that controlled motivation is short-lived and less effective than autonomous motivation.

The concept of relatedness in the SDT is broadly understood as a supportive social milieu. Social support has proven to be an important determinant for behavior change in both secular and faith-based interventions (Grieco, Sheats, Winter & King, 2013; McSpadden et al., 2016; Thompson & Foster 2013). SDT experts have described the process of relatedness as “a sense of being respected, understood, and cared for” that is essential for forming a connected and trusting environment in which internalization can occur (Ryan et al., 2008, p.3). This Daniel Plan pilot was specifically designed with a small, supportive group environment to help meet this need for relatedness.

The final concept of the SDT is competence. Competence is similar to confidence, and requires that practitioners or educators provide the knowledge and tools to help individuals make changes and overcome barriers. Competence is enhanced by an increasing sense of autonomy which allows individuals to be more likely to learn and apply new strategies (Ryan et al., 2008).

Multi-behavior Interventions

Based on a growing understanding about how both positive and negative lifestyle behaviors tend to improve or worsen together, a number of studies, including many faith-based studies, have had multi-behavior targets (Brown, et al., 2015; White, Drechsel, & Johnson, 2006). Unhealthy behaviors such as smoking and avoiding exercise have often co-existed and, likewise, healthy changes such as improved diet and increased exercise have also tended to co-occur (Prochaska, Spring & Nigg, 2008). A number of faith-based studies have found that a positive dietary change is associated with positive physical activity changes (Baruth & Wilcox, 2013; Lippke, Nigg, & Maddock, 2011; Wilcox et al., 2013).

Healthcare has often been tempted to take an actionable and straight-forward physical approach; but people are complex creatures and it has been considered “bad science” to assume that someone can be understood without attending to their physical, mental, social and spiritual dimensions (Gunderson, 2000, p. 257). To be most successful, lifestyle interventions should take a holistic and multifaceted approach. The Daniel Plan is an example of a holistic intervention that targets spirituality, social health, mental health, physical activity, and diet together in one program. The literature has provided evidence that this combined approach may be likely to foster healthy changes.

Faith-Based Wellness Interventions

The search for literature on faith-based wellness intervention studies was done in the Cumulative Index of Nursing and Allied Health, Google Scholar and PubMed. The search was limited to peer-reviewed scholarly articles. Initially, only articles from 2006 and later were included, but this provided limited results (25 studies). The search was extended to 2001 and this added four more relevant and frequently-cited studies. Out of these studies, seven were

found that used a faith-based intervention with a non-faith-based control group. Three of these seven used such different methodology in the control and faith-based intervention group that clear conclusions about the effect of the faith-based components could not be made (Duru, Sarkisian, Leng, & Mangione, 2010; Parker et al., 2010; Yanek et al., 2001). This left four studies that had a comparable secular control group and reported measurable outcomes (Fitzgibbon et al., 2005; Resnicow et al., 2005; Robinson, 2007; Sattin et al., 2016). These four studies will be discussed in further detail near the end of this section.

Almost all studies reported positive results, although some were too small to reach statistical significance. Authors hypothesized that the faith-based approach was successful because of the supportive and encouraging social environment of churches and because the spiritual teaching was able to harness a deep, purposeful motivation to change (Anderson & Pullen, 2013; Kim et al., 2008; Walker et al., 2015; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001). Unfortunately, it has been difficult to compare one study to another or draw generalized conclusions because of the significant variability in methodology. Some studies were small group based, while others were multi-church interventions. Some included details such as exercise classes and motivational interviewing phone calls, while others were only class teaching. Length of intervention varied from six weeks to two years. Delivery was by professionals or by trained lay-volunteers or some combination of the two. Outcome measures were often absent or inconsistent. A great variety of self-report questionnaires were used and some objective outcomes such as lab values and weight measurements were provided.

One large (n = 465) study funded by the National Institute of Health (NIH) evaluated the relationships between individuals' religiosity (engagement in personal and corporate religious practices), religious social support and general social support (Whitt-Glover et. al., 2012). They

found, surprisingly, that the level of religiosity was negatively correlated with levels of both religious and general social support (Harvey, Story, Knutson, & Whitt-Glover, 2016). They hypothesized that these results may suggest that those with a high level of private religious practices may be more insulated from social involvements. A positive correlation was found between religious and general social support, supporting the idea that religious involvement can be an important form of social support for some. They concluded that more research is needed to understand how to harness the positive elements of both religiosity and social support in order to facilitate lifestyle changes.

Two other recent studies with results still pending were funded by the National Institute of Health and targeted African-American churches with sample sizes of 300 to 500 participants (Lancaster, Schoenthaler et al., 2014; Yeary et al., 2015). These studies included questionnaires to evaluate psychosocial variables, self-efficacy, religiosity, daily spiritual experiences, stress, depression, hope, and coping. Results of these studies may provide more insight into the most effective elements of faith-based interventions.

Three reviews on faith-based interventions were found. They concluded that overall there were promising results for faith-based interventions, but that there was a lack of clear intervention details, inconsistent methodology, and insufficient outcome measures. They also noted the preponderance of African American participants. Bopp, Peterson & Webb (2012) found 18 faith-based interventions and 12 of these (63%) reported positive changes in physical activity, fruit and vegetable intake, blood pressure or weight loss. A review of a variety of church-based health promotion interventions from 1990 to 2007 concluded that the church provided an effective social platform and that the spirituality emphasis promoted a fertile ground for behavior changes (Campbell et al., 2007). A systematic review of faith-based or placed

interventions in African American populations found 27 relevant articles (Lancaster, Carter-Edwards, et al., 2014). They calculated that 70% percent of interventions were successful in reducing weight, 60% increased fruit and vegetable intake, and 38% increased physical activity.

A number of studies emphasized the importance of exploring and understanding the local spiritual culture when forming interventions. A successful study by Kim et al. (2008) was designed with the use of focus groups to ensure effective development of the spiritual intervention components. In four rural South Carolina African American churches (n=73) they used a quasi-experimental delayed intervention control group in an eight-week program led by trained lay volunteers. The faith-based treatment group lost three more pounds than the control, 2.5 more centimeters from their hip circumference, and also had statistically significant increases in physical activity. Participants, all women, reported that the faith basis of the program was the key to their success as they believed it helped them overcome emotional eating tendencies and provided positive support instead of pressure to succeed.

In a similar way, the Healthy Body Healthy Spirit trial was designed with the goal of exploring and harnessing the deep spiritual ideology of participants (Resnicow et al., 2005). To have an impact, the authors emphasized, interventions must be designed to harness this deep structure and not just the surface structure of the church as other faith-placed studies have done (Resnicow et al., 2005). Their study (n= 1,056) compared a standard health education control to a culturally and spiritually tailored education. They found a significant increase in physical activity at one-year follow-up, but they did provide pedometers to the intervention group and not the control group. Fruit and vegetable intake increase was significant for all groups, but increased far more (0.78 servings) for the intervention group than the control (0.17 servings).

Fitzgibbon et al. (2005) conducted a 12-week health teaching and exercise class intervention in a Chicago hospital. They had a faith-based intervention group and a non-faith-based control group (n=52). The hospital setting was specifically chosen to limit the likelihood of spiritual components being incorporated into the control group. The same culturally tailored program was delivered to two randomized groups of women, with the intervention group including prayer, praise music, and Biblical references carefully incorporated into all the sessions. Physical activity results were not statistically significant, but weight loss was significantly greater in the faith-based group with an average loss of 2.6 versus 1.6 pounds in the control group.

The Sisters in Motion trial (Duru, et al, 2010) was conducted with a faith-based versus secular control group. At six months the intervention group had increased total weekly steps by 9,883 versus only 2,426 for the control group. They also had an average systolic blood pressure drop of 12.5 versus 1.5, and weight loss of 2.3 pounds versus 1.5 pounds. Although these results are positive, they must be viewed in consideration of the fact that the control group did not receive any health teaching, but rather unrelated education (advanced directives etc.), while the intervention group, in addition to the health teaching infused with Biblical motivation, was also encouraged to set activity goal and provided with pedometers.

Robinson (2007) provided some of the best results in a study that was well controlled with clear methodology. The intervention and control group were predominantly female and low income (n=108). Both groups received the same exercise sessions and nutrition teaching over a six-week period. Compared to the control group the faith-based participants were more likely to attend (mean of 31.6 vs 21.4 per class) and had statistically significant greater decreases in body mass index, body fat percentage and weight (6.1 versus 1.68 average pounds of weight lost).

Sattin et al. (2016) provided standard CDC diabetes prevention teaching to a faith-based and control group (n=604). Although there were no significant differences for total participants, there were significant differences when results were calculated for the 15.2% of the sample that was pre-diabetic (fasting blood sugar from 100-125). After 12 months the pre-diabetic intervention group participants had lowered their blood sugar by 12.38 versus an increase of 4.22 for the control group. Weight loss was also significant for this subsample, with the intervention group losing an average of 5 pounds versus 1 pound gained.

In summary, the well-controlled studies by Fitzgibbon et al. (2005), Robinson (2007), and Sattin et al. (2016) provided evidence that the addition of a faith-based component improved outcomes in wellness interventions. The studies reviewed call for more research in this area, and many point out the need for clearer methodology and concise outcome measures. Rural populations were underrepresented in this type of research.

Methods

This Daniel Plan pilot was implemented in a small, rural Alaskan community. During meetings participants watched a 30-minute DVD, discussed the teaching, spent time in prayer, and encouraged each other. Participants also read *The Daniel Plan: 40 Days to a Healthier Life*, and used the Daniel Plan study guide (Warren, Amen, & Hyman, 2013).

Design

A one group pretest to posttest design was used with self-referred convenience sampling from a local church. Quantitative data included an observed height, weight, and waist circumference. Likert-type questionnaires for physical activity and nutrition were also completed at the first and last meetings. To gain some descriptive feedback for this pilot evaluation of the Daniel Plan, three open ended questions were asked pre-intervention, and four

post-intervention to assess for participants understanding of barriers, success, and explanations of what did or did not facilitate success, as well as their perception of positive outcomes.

Setting

The initial publicized success of the Daniel Plan occurred in a large metropolitan church with significant resources to advertise and facilitate the changes, such as hosting their own fitness and cooking classes (Zastrocky, 2013). This project evaluated this popular faith-based wellness intervention in a different environment, the small, rural community of Homer, Alaska. According to the 2010 Census, Homer had a population of 9,840, with 87% white, and 0.3% Black or African American (United States Census Bureau, 2010). The meetings were held at a small nondenominational church in Homer that was chosen for its convenient central location and availability (see Appendix A).

Consent Process and Protection of Human Subjects

Potential participants were asked to sign a consent (Appendix C) that included all required elements established by the USDHHS. The consent included a statement of intent to participate in all six of the teaching sessions and agreement to allow for height and weight measurements. It also informed participants that any new physical activity routines should be approved by the individual's health care provider and that the researcher holds no responsibility for guidance in this area.

Contact information including name, phone number and email were collected from each participant. This contact information was coded with a symbol that matched each page of the questionnaires provided to the participants at the first and last meetings. These documents containing identifying information were stored separately in a locked cabinet at the author's house. Prior to the final questionnaire completion, a cover sheet with the participant's name was

added to the corresponding questionnaires. The cover sheet was removed and shredded when the questionnaires were delivered to the participants. Weight and height were recorded on the first page of the coded questionnaires. This way confidentiality was protected and participants had as much privacy as possible, as even the author was not able to link names to data during the analysis. The questionnaires and identifiable information will remain in a locked file cabinet at the author's home until the final project defense has been successful, and at that time they will be shredded.

This project presented minimal risk to participants. The curriculum has been previously used by thousands of individuals and the teaching is basic noncontroversial health education. One risk was that being weighed and measured would present an emotional or psychological barrier for some, so this was clearly laid out in the consent form. Another consideration was that some participants would not be healthy enough for some forms of exercise. A disclaimer was made in the consent form that individuals needed to seek that advice of their health care provider about what is safe for them. A list of local health care providers was available for any participants needing further consultation. This same disclaimer was also clearly made in the Daniel Plan DVD. The small group setting may have been a vulnerable situation for some, but for most participants it was similar to small group Bible studies that they have previously participated in so was likely a safe, familiar context.

Recruitment of Subjects

Approval for this project was obtained from the University of Alaska Anchorage Institutional Review Board. A convenience sample of volunteer participants was recruited from a local nondenominational Christian church of which the principal investigator is a member (see Appendix B). An announcement was made during the church service one and two Sundays prior

to the start of the study. The author was available after the service to answer questions and collect consents from participants.

Participants were limited to adults (18 and older) who were able to read and write English without assistance, as evidenced by completion of the consent form (see Appendix C). Exclusion criteria were being less than 18 years of age, inability to read, write, speak, or understand English. Outside of this criteria, invitations to participate was provided on a first come, first served basis, with a maximum of 12 participants. Those who showed interest after the class was full were directed to the Daniel Plan online resources and encouraged to form their own study group.

A maximum group size of 12 was chosen based on literature evidence about the greatest number of participants that still allows for a safe, engaging, and interactive group environment. Dutton et al. (2014) found that groups of 12 or less participants lost more than twice as much weight at the six-month measure, and four times as much weight at the 12-month measure compared to groups of 12 or more. Other sources consistently suggested that for a small group environment 12 is the maximum number in order to facilitate contributions and adequate engagement by members (Atherton, 2013; Oxford Brookes University, 2011; Pereles, Lockyer, & Fidler, 2002).

Intervention

The intervention lasted six weeks and consisted of one evening meeting each week. The first meeting was January 10th, 2017 and the final meeting was February 14th, 2017. Meetings were scheduled for a 90-minute period, except for the first and last meetings which were two hours to allow time for questionnaire completion and weight measurement. The structure of the meetings followed the recommendations of the Daniel Plan creators as outlined in their leader's

guide: A 10-minute introductory time, 30-minute video viewing, 10-minute discussion time, 15 minutes for optional activities, and 10 minutes for prayer (Warren, 2013). These activities added up to 75 minutes. The 90-minute time allowance provided some flexibility and helped ensure meetings were concluded in a timely fashion.

The optional activities were outlined in the leader's guide and included some additional short videos on diet or exercise, or time to plan group activities such as a hike during the week. During the prayer time, participants were invited to pray for each other, and a benediction prayer provided in the study guide was read aloud in closing. As outlined in the leader's guide, efforts were made to create a welcoming, nonjudgmental, supportive environment for growth, thus seeking a sense of relatedness that was most likely to foster behavior change (Warren, 2013).

The leader's guide recommended that participants purchase a study guide and read through Daniel Warren's book, *The Daniel Plan, 40 Days to a Healthier Life* (Warren, Amen, & Hyman, 2013). Twelve study guides and books were preordered from Amazon.com and made available for pick-up during the recruitment at church. If the participants inquired, they were invited to make donations for these books up to the estimated cost of \$15, but were not required to do so. The author paid the difference in book costs minus donations from participants.

The topics and teachings for the first five sessions followed the five foundational principles of faith, food, fitness, focus and friends, and the final session, "living the lifestyle," encouraged lasting behavior change. The food, fitness, and focus sessions provided straightforward teaching on nutrition, exercise and mental health. The faith and friends principles are what Pastor Warren described as the "special sauce:" the key ingredients that would help participants make the challenging but necessary modifications towards healthier lifestyles (Warren, 2013).

Week six followed the same general organization as the previous weeks, with a DVD teaching and discussion time. The DVD teaching reminded participants of what they have learned and provided encouragement and guidance on sustaining changes they have made. The discussion time focused on sharing successes and planning for the future, including the possibility of continuing to meet in some fashion for exercise, prayer and encouragement. The leader's guide suggested that this last meeting could be a potluck, with each participant bringing a new healthy dish they have learned to enjoy. Participants chose to do this, and as they shared a meal, they planned to meet once monthly in the future to encourage each other and do a weigh-in to keep each other motivated.

Attendance was tracked weekly. Participants who missed a meeting were encouraged to do a make-up session by viewing the DVD and completing the corresponding study guide section. They were also encouraged to reach out to another group member for a time of discussion and prayer about the week's topic, as the social support and relationships provided by the group was an important part of the intervention.

Measurements

The clinical questions for this project were if the Daniel Plan led to weight loss and decreased waist circumference, and to self-reported positive diet and exercise changes. To evaluate this, participants were weighed, measured, and completed a self-report questionnaire on physical activity and nutrition at the beginning and end of the Daniel Plan study. The pre-intervention and post-intervention questionnaires included three or four open ended questions that explored participants past barriers, goals, successes and their ideas about what would help them in the future. These additional questions were chosen to add descriptive depth and meaning to

the quantitative results and perhaps also provide direction for future study and interventions (Appendices D & E).

Demographics. Demographics were self-reported on the first page of the initial questionnaire packet (Appendix D). Based on what was most frequently cited in the literature on faith-based wellness interventions the following information was gathered: age, sex, ethnicity, employment status, education level, average household income level, marital status, and number of household members.

Weight and BMI measurement. Height and weight were measured by the author at the first meeting, and weight only at the final meeting. A new digital scale, Conair Weightwatchers (Model WW401GD), was purchased for the study. It was used pre and post intervention and participants were asked to wear light clothing of similar weight at the first and last meeting. Weight was measured to the nearest tenth of a pound. Height was measured sock-footed to the nearest half inch.

Waist circumference measurement. Increased waist circumference has been associated with increased risk of obesity related diseases such as diabetes and cardiovascular disease for all individuals, even those with underweight BMIs (de Hollander et al., 2012; Dogra et al., 2015). Participants' waist circumferences were measured according to the CDC standards, with the tape measure horizontal, just above the hip bones, and the measurement recorded at the end of a normal exhalation to the nearest quarter inch (CDC, 2015b).

Physical activity measures. The Rapid Assessment of Physical Activity (RAPA) questionnaire was used to measure participants' baseline and six week levels of physical activity (University of Washington Health Promotion Research Center, 2006). This tool is nine questions long and includes seven aerobic activity questions and one question each for strength and

flexibility. Scores for aerobic activity are zero to seven, ranging from sedentary to active. Scoring is based on the CDC's physical activity guidelines, with a score of six or more corresponding to the recommended 150 minutes of moderate exercise a week (CDC, 2015e). In the RAPA 60 minutes of vigorous exercise weekly is scored as active, although this is slightly under the 75 weekly minutes that the CDC recommends (CDC, 2015e).

A reliability and validity study for the RAPA was done by Topolski et al. (2006). They compared results with the longer, validated Community Healthy Activities Model Program for Seniors (CHAMPS) questionnaire. They also scored two other brief physical activity questionnaires. Although the reliability coefficient ($r=0.54$) was relatively low, the RAPA performed better than the other brief, validated options. A more current literature search did not reveal any other brief, validated physical activity tools that perform better. Other analysis for the RAPA included: sensitivity (81%), specificity (69%), positive predictive value (77%) and negative predictive value (75%).

The RAPA scoring did not distinguish between a participant doing 30 minutes of moderate activity one day a week versus four days a week; they were both scored as under-active. In order to capture these important increases, two additional questions were added that ask the participant to list the number of days per week that they engaged in moderate physical activity and vigorous activity (Appendix F). Previous research has added these two questions to the RAPA (University of Colorado, Denver, n.d.).

Nutrition measures. To measure dietary changes two brief food screeners developed by Block et al. (2000) were used (Appendices G & H). These screeners measured fruit, vegetable, fiber, and fat intake. They were freely available online for individual use, and may be used for student research at no cost (K. Kline, personal communication, August 29, 2016). The brief

screeners were validated by a comparison to the standard of the previously validated 100-item full length Block Food Frequency Questionnaire (Block et al., 2000). Reliability coefficients of 0.6 to 0.7 ($p < .0001$) were found for fruit, vegetable, fiber and fat intake measures. Although these coefficients are less than ideal, they are much higher than other brief validated dietary screeners that were found (Paxton et al., 2011)

Results

Clinical questions for this project were whether the Daniel Plan would lead to weight loss, decreased waist circumference, increased physical activity, and improved nutrition. The data analysis showed that for all of these variables the Daniel Plan study resulted in improvements, although not all of the results reached the level of statistical significance. Statistics were calculated for the final nine participants only, as three of the initial twelve were lost to follow up. Results were analyzed with the IBM Statistical Package for the Social Sciences, version 22 (see Table 1). See Appendix I for complete results. Data was tested for normality and paired samples t -tests done for those that met normality assumptions, and the sign test for those that did not.

Table 1
Summary of Quantitative Data Outcomes (n=9).

Measurements	Mean Change	Statistically Significant
Weight	- 5.9 pounds	$p = .001$
Waist Circumference	- 0.8 inches	$p = .002$
Body Mass Index	-1.0 kg/m ²	$p = .001$
Moderate aerobic activity	+ 0.75 days/week	no
Vigorous aerobic activity	+ 0.63 days/week	no
RAPA Aerobic	+ 1.22 points	$p = .023$
RAPA Strength & Flexibility	+ 1.0 points	no
Fruits and Vegetables	+ 0.67 servings/day	no
Fat calories	-5.0 %/day	$p = .003$
Fiber	+ 1.9 grams/day	no

Attendance

Attendance was 75% for the twelve initial participants, and 91% for the nine who completed the study. Of those who were lost to follow up, one participant had been visiting the recruiting church for the first time when she signed up and explained that the religious focus was more intense than she was ready for at the time. Another, a mother of four, was unable to attend due to personal and family illnesses. Another simply did not attend half the meetings. For those that did complete the study, the few absences were due to personal illness (see Appendix J).

Demographics

Participants were almost all female, with one male whose wife also attended. All nine who completed the study identified as white. Seven (78%) worked full time, and three worked part-time. Seven attended some college (78%). Six (67%) had an annual household income between \$40,000 and \$80,000. Six (67%) were married and lived in households of two. Three lived in a household of one (33%). The mean age of participants was 57 years, with a range from 22 to 72. See Appendix K for complete demographics.

Weight and Body Mass Index

All the participants who completed the study lost weight. Mean weight loss was 5.9 pounds. Assumptions of normality were met (Shapiro-Wilk = .981, $p = .966$), and the t -test revealed statistical significance, $t(8) = 4.8$, $p = .0014$, 95% CI [3.1, 8.8]. Effect size was medium ($d = 0.73$). Weight loss was greater for those with higher BMIs. Every participant with a BMI >30 lost at least six pounds, while the minimum weight lost (0.6 pounds) was a participant with an initial BMI of 20.2, low enough that weight loss was not a goal for her.

Mean reduction in BMI was 1.0 kg/m². Measures of normality were met, (Shapiro-Wilk = .898, $p = .276$), and the t -test showed statistical significance: $t(8) = 5.16$, $p = .001$, 95% CI [.559, 1.463]. Effect size was medium ($d = 0.76$). Although this was a small sample, the results were clinically significant. It is particularly notable that all of the obese participants lost at least a pound a week.

Waist Circumference

All nine final participants had a reduction or no change in waist circumference, with a mean loss of 0.8 inches. Reductions ranged from one participant with a zero change, to a maximum of 1.75 inches. This data met assumptions of normality (Shapiro-Wilk = .95, $p = .714$) and was found to be statistically significant, $t(8) = 4.4$, $p = .002$, 95% CI [0.38, 1.22].

Effect size was medium ($d = 0.70$). Again, the small sample size must be considered, but this was also a clinically significant reduction in waist circumference, a measurement that is an important marker of disease risk (CDC, 2015b).

Physical Activity

All of the physical activity measures resulted in mean increases, although not all the results were statistically significant. Days per week of moderate physical activity increased by 0.75 for the eight who completed this question. This data was normally distributed but the t -test did not show statistical significance ($p > .05$). Despite this, half (4/8), increased their days per week of moderate activity, and the only decrease was a participant who went from five to four days per week, meaning she was still quite physically active.

Days per week of vigorous physical activity increased by 0.63 for the eight who completed this question. This data was not normally distributed and the Sign Test was not significant ($p > .05$). Most participants (5/8) did not engage in vigorous exercise and this was unchanged during the study. Increases of one to three days weekly were achieved for three participants. Considering the mean age of 57, it is not surprising that there was less change in this area of exercise.

The aerobic exercise portion of the RAPA questionnaire revealed a mean increase of 1.22 points on the zero to seven scale. This data fit assumptions of normality (Shapiro-Wilk = .930, $p = .512$) and was statistically significant, $t(8) = 2.82$, $p = .023$, 95% CI [0.22, 2.22]. Although two participants had no change in scores and one decreased, all three of these participants scored a six or seven on the initial and final questionnaires, a score that is equivalent with meeting the CDC guidelines for weekly physical activity. This means that all the under-active participants increased their scores. The effect size was medium ($d = 0.56$), but as noted, this was limited by

the fact that three participants had little room for improvement due to a high baseline level of physical activity.

Weekly strength or flexibility training as measured by the two final questions on the RAPA also improved, with a mean increase of 1.0 on the zero to three scale. This data was not normally distributed and not statistically significant. Two added both of these activities, two added one of the activities, while two continued to do both, and three continued to do neither.

The literature review revealed that increasing physical activity is one of the more challenging lifestyle changes to make and this was somewhat confirmed in these results, although the small sample size made it hard to draw conclusions. When all the measures of physical activity were considered together it was found that three participants started out very active and remained that way, three made significant changes, and three started out underactive and although they made some small changes, were still underactive at the end of the study. This result, of improvement in about a third of participants is similar to the results from the most recent review of literature where it was found that 38% of studies resulted in significant increases in physical activity (Lancaster, Carter-Edwards, et al., 2014).

Nutrition

The nutrition screeners were designed to be completed online and results are provided immediately: servings of fruits and vegetables per day, grams of fiber daily, and percentage of calories from fat. Participant responses were entered online by the author and results recorded. The data output contained ranges, such as “<4” for fruits and vegetables and “<30%” for fat intake. These were rounded to the most appropriate single number to allow for statistical analysis. Details of these adjustments are noted at the end of Appendix I.

Estimated daily servings of fruits and vegetables had a mean increase of 0.67. This data was not normally distributed, and the sign test did not show significance ($p = .063$). These results are likely limited by the tool used, which only had seven questions for fruits and vegetables and did not include serving sizes (Appendix G). Participants could have changed from having a $\frac{1}{4}$ cup of vegetables or a very small green salad at dinner, to having two whole cups of vegetables or nothing but a green salad and the data would not have changed. In addition, three of the seven questions asked about fruit juices, vegetable juices, and potatoes, all things that the Daniel Plan discourages in favor of whole foods and less starchy vegetables.

During the small group conversations participants shared how they were increasing their vegetable intake towards the Daniel Plan goal of half of every meal being vegetables. Some were adding kale and spinach to breakfast smoothies and a few had even started making “pasta” from zucchini and other vegetables. So although the brief screener failed to capture these changes, participant comments revealed significant increases in fruit and vegetable intake and the changes in weight and waist circumference were evidence of improved eating habits.

Estimated fiber intake increased by a mean of 1.9 grams per day. Again, the brief screeners likely failed to reveal what was most likely a more significant increase. Two questions focused on high fiber cereals and whole grain breads as a source of fiber. This was problematic as a number of participants reduced their bread and cereal intake. This made the fiber scores lower, even though they were likely getting more fiber from a diet high in whole vegetables.

The screener for percent of daily calories from fat asked about intake from meat, dairy, and dessert foods (see Appendix H). Results revealed a mean decrease of 5%. Data was normally distributed (Shapiro-Wilk = .849, $p = .093$) and the t -test showed statistical significance, $t(8) = 4.24$, $p = .003$, 95% CI [-2.28, -7.72]. The effect size was medium ($d = .69$).

The questionnaire results revealed a decrease in high fat meats, most dairy products and desserts. Increased were seen in the question about “margarine, butter or oil in cooking,” probably because the Daniel Plan encouraged the use of healthy oils such as virgin olive oil, grapeseed and coconut oil for cooking. Egg intake also increased. Eggs were encouraged in the Daniel Plan, particularly at breakfast time as a source of protein when many other breakfast options are high in carbohydrates and lacking protein. So again, results were positive, but due to the limited nature of the brief screeners, likely underestimated the magnitude of positive changes made by participants.

Subjective Outcomes

Pre-intervention questionnaire. Participants explained that a lack of consistency and self-control have been barriers to succeeding at lifestyle changes. Four participants mentioned battling cravings for chocolate, sweets, breads or pastas. One participant explained that the challenge is “truly making a lifestyle change instead of adhering to a ‘diet.’” Other challenges included the long dark winters, having to feed five other family members, being an emotional eater, and dealing with chronic pain.

In response to the question of what has worked for lifestyle changes in the past there was a variety of answers from “nothing yet,” to doing programs in groups such as weight watchers and using the accountability of a nutritionist and physical trainer. Other responses included exercising, guilt, trying to fit into clothes, fear of growing old, counting calories, and maintaining consistency in exercise and eating habits.

The most common goals or motivations participants had for the Daniel Plan was wanting to lose weight and wanting to grow closer to God. Participants described wanting to be “more in the Word,” or have a “God-dependent attitude,” and to “honor Him” by living a healthier life.

Several were motivated by the desire to be healthy for family. The desire to develop a lifestyle that is not just focused on losing weight, but on balance in all areas was expressed by several participants, voiced by one as the desire for “actually living a changed life.”

When asked how they thought the Daniel Plan study would help them achieve their goals, four participants indicated the benefit of accountability, and another four mentioned the motivation they would find from being in a group. Learning more about healthy eating was mentioned by three. Five participants described their hopes that the “spiritual aspect” of the study would help because for the first time “my faith will be a factor.”

Post-Intervention questionnaire. All nine participants who completed the study indicated that, “Yes,” this study helped them make positive health behavior changes. Almost all participant reported better eating habits and several mentioned increasing their exercise routines. The most common nutrition change was less sugar, and two mentioned avoiding wheat products. One participant said she has removed sugar and sweets from her eating, “it was amazing how much I found myself reaching for it unaware!” She went on to say, I have switched to “choosing ‘good’ food that nourishes in place of empty food.” One participant stopped drinking diet soda, and one reported having “totally changed my eating habits.”

When asked what was most effective at facilitating positive changes the most common and almost universal answer was the support of the group. This was described as “the energy of doing it together,” “having a buddy,” “knowing we were in it together,” or having “friends, helpful in accountability and encouragement.” One wrote, “meeting weekly with the group helped tremendously,” and another explained that, “gathering together in a supportive group where we encouraged each other and shared ideas” was most helpful.

The second most common element mentioned as a key to successful change was the “emphasis on the Spiritual.” One participant wrote, “I really believe it was crucial to put eating, exercise and God together.” Another said her ability to make changes was because of “adopting the attitude that my Lord God plays a part in inspiring us to make healthy decisions and that [He] wishes to strengthen us in our resolve.”

Other effective elements described were the nutrition teaching, the recipes, learning the benefits of healthy eating and the non-legalistic approach. A few mentioned the teaching from the book and the DVDs. One woman who had tried and failed at a number of diets said, “I am encouraged that this way of living (Faith, Food, Focus, Friends, Fitness) is a way of life rather than a ‘diet.’”

Plans for continued success included the goal of “staying consistent with this new and better lifestyle” and being “involved in further groups like this.” A few mentioned the need to find an exercise partner or more fun exercise activities that they will actually do. One mentioned the need to continue to rely on God for her resolve to maintain positive changes. Another said that she plans to do the detox diet (avoiding all sugar, flour and dairy for 10 days) that Dr. Hyman recommended anytime she noticed her eating habits getting out of control again as it resets her focus and stops her food cravings.

In addition to questions about what changes they had made, participants were also asked what positive benefits they perceived from these changes in terms of mental, physical, relational or other areas of their life. These responses were universally enthusiastic and positive. They are transcribed in their entirety into Appendix L. Highlights included having a clearer mind, more strength and energy, being able to tie shoes without gasping for breath, better social interactions,

a new found “freedom and joy” in making good food choices, an improved spiritual focus, and less “desperation hunger.”

Discussion and Conclusions

Change in Practice

The positive results from this study have reinforced the value of assessing patients’ spirituality and using this as a motivational tool to help them make lifestyle changes. The findings have also suggested that those trying to make changes should be encouraged to join a group that will help motivate them and hold them accountable, or, if this is not possible, to partner with a friend or spouse in working at making changes. The results have also revealed that the Daniel Plan program is worth recommending to participants who identify as Christian. The books and DVDs can be purchased online by anyone and together with the study guide and online resources any layperson could effectively lead a study in their own home.

The positive results of this study have been consistent with previous literature that has found spirituality to be a critical motivator in making lifestyle changes. The importance of group settings or other relationships as an important aspect for motivation and accountability has also been validated. Success in previous studies has been attributed to a supportive and encouraging social environment and the ability of spiritual teaching to harness a deep, purposeful motivation to change (Anderson & Pullen, 2013; Kim et al., 2008; Walker et al., 2015; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001). The responses of this project’s participants have echoed those findings, with many having commented on the motivation that the group environment and the spirituality focus provided for them.

The positive results from this pilot have provided a specific intervention, the Daniel Plan, that can be recommended to those patients who identify as Christian and need to make health-

behavior changes. It has also provided evidence that other similar spiritually based programs, such as Thin Within, Overeaters Anonymous and the Weigh Down Workshop may be effective for some.

Outcomes and Self Determination Theory

The SDT has argued that competence, autonomy, and relatedness are necessary to inspire effective, internal motivation. The positive objective results from this project and the comments made by participants have supported this theory. Competence was facilitated through the teaching on nutrition, exercise, and mental focus. Several participants mentioned that the DVDs and the book provided helpful teaching about making healthier meals and becoming more mindful about eating.

Autonomy was fostered initially through the participants' self-selection. Participants continued to behave with autonomy as they chose what information to incorporate into their own lifestyle. Some chose to follow a strict detox plan for 10 days, while others made much simpler changes. The importance of autonomy for the SDT has been that it leads individuals to align a behavior with other central values in their lives. This was seen in the comments participants made about how valuable it was to put "eating, exercise and God together," and how they were able to make changes with a new-found awareness that "God plays a part" in making lifestyle choices. Aligning their closely held spiritual beliefs with food and exercise behaviors created internal motivation. The six-week length of this project limits an evaluation of sustainability, but in the short term, the results suggested that this autonomous, internal motivation was critical to the project's success.

The concept of relatedness and its ability to foster lifestyle changes was also clearly supported by the participants' comments. As mentioned, when asked what was most effective in

facilitating changes, almost every participant mentioned the support of the group. And when asked what they need to do to maintain positive changes comments included the need for more groups like this and the support of a friend to get them exercising more.

Limitations and Recommendation for Further Study

Limitations of this project included the small sample size and the lack of a control group. Future research should include a larger sample and a control group that has the same physical, nutritional and mental health teaching without the faith-based elements to truly discern how effective the faith-based element is in motivating individuals to make changes. Another limitation was the loss of participants during the study. One participant realized at the first meeting that her newly revitalized interest in religion was not ready for the spiritual focus presented in the Daniel Plan. Other absences were due to sickness. One mother of four was unable to attend most meetings due to her own or family illnesses. The time of year was a factor in this regard, as there is more sickness during the winter months. The time of recruitment, on January 1st and January 8th, may also have limited participants as many church members were not in attendance on New Year's Day.

An area for further research identified during this study was the need for simple, concise, current, and validated food screener. The food screeners used in this study were the most fitted that could be found for the purpose, but they failed to capture the extent of diet changes that were made. As discussed in the results section, there was no serving size measurement and the questions were not fitted to the Daniel Plan teaching. For example, increasing fruit juice and whole wheat bread intake would have provided better scores, but were not recommended in the Daniel Plan.

One promising concept that participants commented on was the ability to calm sugar cravings by avoiding it altogether. USDHHS current guidelines highlight the importance of limiting sugar intake to less than 10% of our diet (Frank, 2016), but perhaps cutting out added sugar altogether would be more beneficial as it may suppress individuals' cravings. This warrants future research.

In this project, as with others found in the literature review, increasing physical activity was one of the more challenging aspects of making changes towards a healthier lifestyle. Future research should explore ways to make physical activity a part of everyone's day. Accessible and affordable options are needed and workdays need to be adjusted to make time for people to move.

Dissemination Plan

Poster presentation will be made at the 2017 Alaska Nurse Practitioner Conference. A brief summary of results will be mailed to the local church from which participants were recruited. Participants will also be emailed a summary of objective and subjective outcomes.

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Appendix A**Refuge Agency Support Letter**

Attn: Institutional Review Board
Office of Research and Graduate Studies
University of Alaska Anchorage
3211 Providence Drive
Anchorage, AK 99508

Dear IRB Members,

This memo certifies that Anna Williams has shared and discussed the study titled **Faith based motivation for health behavior change: A pilot of the Daniel Plan in a small, rural, Alaskan community** with myself and/or a representative of our agency, **Refuge Chapel**.

Anna Williams has permission to use our church as a location for this six-week Bible study that will begin in January 2017.

This memo also confirms that Anna Williams has permission to conduct the above stated study at Refuge Chapel for the purpose of meeting requirements for a Master's of Nursing Science at University of Alaska Anchorage.

I do not have concerns about the proposed study based on communication with Anna Williams. The agency supports the research plan and approves of the project, which includes recruitment of participants and data collection, through our agency.

Sincerely,

A handwritten signature in cursive script, appearing to read "Darren Williams".

Pastor Darren Williams
397 East Pioneer Avenue
Homer, AK 99603
(907) 235- 4744

Appendix B**Church on the Rock Homer Agency Support Letter****Church on the Rock HOMER**

PO BOX 2689, HOMER, ALASKA 99603
PHONE: (907) 235-2689 FAX: (907) 235-2687
E-MAIL: OFFICE@COTRHOMER.ORG

10/24/2016

Attn: Institutional Review Board
Office of Research and Graduate Studies
University of Alaska Anchorage
3211 Providence Drive
Anchorage, AK 99508

Dear IRB Members,

This memo certifies that **Anna Williams** has shared and discussed the study titled **Faith based motivation for health behavior change: A pilot of the Daniel Plan in a small, rural, Alaskan community** with myself and/or a representative of our agency, **Church on the Rock Homer (COTRH)**.

Anna Williams has permission to announce and recruit for this study at our regular church services on January 1st and January 8th, 2017. We do not have a space for the meetings to occur, but are willing to help facilitate the recruitment and planning through our church services and our office.

This memo also confirms that Anna Williams has permission to conduct the above stated study at Church on the Rock Homer for the purpose of meeting requirements for a Master's of Nursing Science at University of Alaska Anchorage.

I do not have concerns about the proposed study based on communication with Anna Williams. The agency supports the research plan and approves of the project, which includes recruitment of participants and data collection, through our agency.

Sincerely,

Michael Beard
Bible Study Coordinator, COTRH
1104 Ocean Drive
Homer, AK 99603
(907) 235-2689

Appendix C

Consent Form

FAITH-BASED MOTIVATION FOR HEALTH BEHAVIOR CHANGE: A PILOT OF THE DANIEL PLAN IN A SMALL, RURAL, ALASKAN COMMUNITY

CONSENT FORM

PRINCIPAL INVESTIGATOR

Anna Williams, RN, MS Candidate
School of Nursing
University of Alaska Anchorage
(907) 399-3409
ajdickerson@alaska.edu

FACULTY LIASON

Dr. Montgomery, PhD, ANP, FNP-BC, PMHNP-BC
School of Nursing
University of Alaska Anchorage
(907) 786-1695
cdmontgomery2@alaska.edu

DESCRIPTION

Making lifestyle changes that lead to weight loss and better health is challenging. The Daniel plan provides Biblical inspiration in a small group setting to motivate participants to make these changes. There will be six weekly meetings. The first and final meeting will be two hours to allow time for participants to be weighed, height and abdominal circumference measured, and exercise and nutrition questionnaires completed. The other meetings will be ninety minutes. There will be DVD viewing, discussion and prayer time at each meeting. Participants will also be asked to read the book, *The Daniel Plan: 40 Days to a Healthier Life*, and work through the study guide (free to participants, donations accepted).

VOLUNTARY NATURE OF PARTICIPATION

Your participation in this study is voluntary. In other words, you are free to make your own choice about being in this study or not, and may quit at any time without penalty.

CONFIDENTIALITY

Your name and personally identifiable information will be kept in a locked file at the principal investigators home. Any university faculty who assist in analysis will not have access to your name or contact information. Any information from this study that is published will not identify you by name. With your permission, your name, phone number and email will be obtained and used to send meeting reminders. A group phone list will be completed at the first meeting to facilitate potential group activities during the week, but you may decline to participate in this list.

BENEFITS

A sedentary lifestyle and poor diet choices leads to a number of chronic diseases and improvements in these areas leads to improved health. It is hypothesized that this study will motivate participants to make improvements in these areas, but the outcomes are unknown.

RISKS

At the first and last meeting participants will be weighed, and height and abdominal circumference will be measured. This will be done in a private room. Changes in diet and exercise can be harmful for your health. This study does not provide any medical oversight and the researcher has no responsibility for ensuring that lifestyle changes recommended are safe for each participant. Any changes should be discussed with your health care provider.

TIME COMMITMENT

This study will involve a significant time commitment from you. Weekly meetings are scheduled to begin January 10, 2017, and to be completed the week of February 12, 2017. Due to the need for a small group environment, there will be a maximum of twelve participants. If any participants are unable to attend all the meetings, this will greatly impact the ability to obtain outcome data. The investigator requests that any potential participants agree that they intend to participate in all six meetings. If, due to unforeseen circumstances, a meeting is missed, accommodation will be made for a make-up session.

CONTACT PEOPLE

If you have any questions about this research, please contact the Principal Investigator at (907) 399-3409. If you have any questions about your rights as a research subject, please contact Sharilyn Mumaw, University of Alaska Anchorage Research Compliance Officer, at (907) 786-1099.

SIGNATURE

Your signature on this consent form indicates that you fully understand the above study, what is being asked of you in this study, and that you are signing this voluntarily. It also indicates that you fully intend to participate in all six meetings and are willing to do make-up sessions if, due to unforeseen circumstances, a meeting is missed. *If you have any questions about this study, please feel free to ask them now or at any time throughout the study.*

Signature _____ Date _____

Printed Name _____

COMMUNICATION PERMISSION

By providing my contact information below, I give the principal investigator permission to contact me with meeting reminders and with any unforeseen schedule changes:

Phone: _____

Email: _____

SCHEDULING PREFERENCE

Meetings will occur on Tuesday nights, starting January 10, 2017. The final meeting falls on February 14th, Valentine’s Day. Please indicate your preference for this final meeting by checking a box, and note any of the days that you know you will not be able to meet.

- | PREFERRED | UNABLE TO ATTEND |
|--|--------------------------|
| <input type="checkbox"/> Valentine’s Day..... | <input type="checkbox"/> |
| <input type="checkbox"/> Wednesday the 15 th | <input type="checkbox"/> |
| <input type="checkbox"/> Thursday the 16 th | <input type="checkbox"/> |
| <input type="checkbox"/> Saturday the 18 th at 10 am..... | <input type="checkbox"/> |
| <input type="checkbox"/> Other: _____ | <input type="checkbox"/> |

A copy of this consent is available for you

Appendix D

Pre- Intervention Questionnaire

Age:	_____			Height:	_____	Weight:	_____
Sex:	M	/	F	WC:	_____		
Ethnicity:	White	Black/African Am.	Asian	Hispanic/Latino			
	Hawaiian/ Pacific Islander		AK Native/ Am. Indian				
Employment:	Full Time	Part time	Homemaker				
	Retired	Student	Other: _____				
Education Level:	Did not complete High School	GED or Diploma					
	Some College or Tech School	College Graduate					
Annual Household Income Estimate:	<\$20,000	\$20,000 – 39,999	\$40,000 – 79,999	>\$80,000			
Relationship Status:	Single/Married/Other:- _____			Household size:	(#) _____		

1. In any previous efforts to improve lifestyle habits such as nutrition and exercise:
 - a. What have you found to be your greatest barriers to succeeding?

 - b. What has worked for you?

2. What are your goals for this Daniel Plan study and what motivates you to achieve these goals?

3. How do you think this study will help you achieve those goals?

Appendix E

Post-Intervention Questionnaire

Thank you for participating in the Daniel Plan study. Please complete the following questions.

1. Did this study help you make positive health-behavior changes? Yes/No
If you made changes, what were they; if not, why do you think you didn't?

2. What elements of the study were most effective in helping you make changes? Or if you didn't make changes, what would have helped?

3. What do you think could help you make some/more positive health-behavior changes in the future (may be a component of the Daniel Plan or something entirely different)?

4. What positive changes or benefits (mental, spiritual, physical, and/or relational) have you experienced from participating in this study and/or from the Daniel Plan recommended lifestyle changes you have made? If you have experienced negative changes, please explain.

Appendix F

Physical Activity Questionnaire

Light activity level: Your heart beats slightly faster than normal; you can talk and sing. Examples include walking slowly, stretching, vacuuming, or light yard work.
Moderate activity level: Your heart beats faster than normal; you can talk but not sing. Examples include fast walking, aerobics class, doing weights, or swimming gently.
Vigorous activity level: Your heart beat increases a lot; you can't talk or your talk is broken up by large breaths. Examples include jogging, running, basketball, or hiking up a steep hill.

1. How many days per week do you do moderate physical activities for at least 30 minutes? _____
(Please write "0" if the answer is "none.")
2. How many days per week do you do vigorous physical activities for at least 20 minutes? _____
(Please write "0" if the answer is "none.")

Thinking back on **the past 30 days**, please check yes or no for each statement.

1.	I rarely or never do any physical activities.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
2.	I do some light or moderate physical activities, but not every week.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
3.	I do some light physical activity every week.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
4.	I do moderate physical activities every week, but less than 30 minutes a day or 5 days a week.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
5.	I do vigorous physical activities every week, but less than 20 minutes a day or 3 days a week.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
6.	I do 30 minutes or more a day of moderate physical activities, 5 or more days a week.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
7.	I do 20 minutes or more a day of vigorous physical activities, 3 or more days a week.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
1.	I do activities to increase muscle strength, such as lifting weights or calisthenics, once a week or more.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
2.	I do activities to improve flexibility, such as stretching or yoga, once a week or more.	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>

Appendix G

Food Screener for Fruits, Vegetables, and Grains

Fruits, Vegetables, and Grains	Less than once a WEEK	Once a WEEK	2-3 times a WEEK	4-6 times a WEEK	Once a DAY	2+ a DAY
Fruit juice, like orange, apple, grape, fresh, frozen or canned. (Not sodas or other drinks)						
How often do you eat any fruit, fresh or canned (not counting juice?)						
Vegetable juice, like tomato juice, V-8, carrot						
Green salad						
Potatoes, any kind, including baked, mashed or french fried						
Vegetable soup, or stew with vegetables						
Any other vegetables, including string beans, peas, corn, broccoli or any other kind						
Fiber cereals like Raisin Bran, Shredded Wheat or Fruit-n-Fiber						
Beans such as baked beans, pinto, kidney, or lentils (not green beans)						
Dark bread such as whole wheat or rye						

Appendix H

Food Screener for Meats and Snacks

Meats and Snacks	Once a MONTH or less	2-3 times a MONTH	1-2 times a WEEK	3-4 times a WEEK	5+ times a WEEK
Hamburgers, ground beef, meat burritos, tacos					
Beef or pork, such as steaks, roasts, ribs, or in sandwiches					
Fried chicken					
Hot dogs, or Polish or Italian sausage					
Cold cuts, lunch meats, ham (not low-fat)					
Bacon or breakfast sausage					
Salad dressings (not low-fat)					
Margarine, butter or mayo on bread or potatoes					
Margarine, butter or oil in cooking					
Eggs (not Egg Beaters or just egg whites)					
Pizza					
Cheese, cheese spread (not low-fat)					
Whole milk					
French fries, fried potatoes					
Corn chips, potato chips, popcorn, crackers					
Doughnuts, pastries, cake, cookies (not low-fat)					
Ice cream (not sherbet or non-fat)					

Appendix I

Data Tables for Biophysical Measurements, Nutrition, and Physical Activity (PA)

Variables	Final Nine Participants										Mean
Attendance (%)	67	100	100	83	100	100	100	83	100	91	
Weight (pounds)											
Initial	106.9	151.0	149.5	222.2	180.2	259.4	125.0	177.2	189.8		
Final	103.8	146.2	145.8	215.6	174.2	245.9	124.4	171.1	180.8		
Change	-3.1	-4.8	-3.7	-6.6	-6.0	-13.5	-0.6	-6.1	-9.0	-5.9	
BMI (kg/m²)											
Initial	22.4	26.8	25.5	37.6	30.0	43.3	20.2	28.7	28.1		
Final	21.7	26.0	24.7	36.5	29.0	41.0	20.1	27.7	26.8		
Change	-0.7	-0.8	-0.8	-1.1	-1.0	-2.3	-0.1	-1.0	-1.3	-1.0	
Waist Cir. (inches)											
Initial	31.2	36.50	33.50	45.00	44.25	59.00	31.75	39.5	40.50		
Final	30.5	36.50	32.25	44.75	43.50	57.75	31.00	37.75	40.00		
Change	-0.75	0	-1.25	-0.25	-0.75	-1.25	-0.75	-1.75	-0.5	-0.8	
Fruit&Vegetable (servings/day)^a											
Initial	4	3.5	4	5	2.5	2.5	4	4	2.5		
Final	5	4	4	5	5	3.5	4	5	2.5		
Change	+1	+1	0	0	+2	+1	0	+1	0	+0.67	
Grams of fiber (per day)											
Initial	21	10	17	11	8	11	19	22	11		
Final	18	12	15	20	10	17	21	22	12		
Change	+3	+2	-2	+9	+2	+6	+2	0	+1	+1.9	
Fat Calories (%/ day)^b											
Initial	32.5	37.5	37.5	32.5	32.5	37.5	37.5	27.5	37.5		
Final	27.5	32.5	32.5	27.5	32.5	32.5	27.5	27.5	27.5		
Change	-5.0	-5.0	-5.0	-5.0	0	-5.0	-10.0	0	-10.0	-5.0	

Appendix I (Continued)

Variables	Final Nine Participants										Avg.
Moderate PA											
(days/week)											
Initial	3	5	4	0	0	-	2.5	0	4.5		
Final	6	4	5.5	1	0	-	2.5	0	5		
Change	+3	-1	+1.5	+1	0	-	0	0	+0.5	+0.75	
Vigorous PA											
(days/week)											
Initial	1	0	4.5	0	0	-	0	0	0		
Final	2	0	5.5	0	0	-	3	0	0		
Change	+1	0	+1	0	0	-	+3	0	0	+0.63	
RAPA Aerobic											
Score ^c											
Initial	4	6	7	2	1	4	4	1	7		
Final	6	6	7	4	3	6	7	2	6		
Change	+2	0	0	+2	+2	+2	+3	+1	-1	+1.22	
RAPA Strength & Flexibility											
Score ^d											
Initial	3	0	3	0	0	0	2	0	0		
Final	3	0	3	3	0	3	3	2	0		
Change	0	0	0	+3	0	+3	+1	+2	0	+1.0	

^a Fruit and vegetables output adjusted as follows: <3 changed to 2.5, <4 changed to 3.5.

^b Percent of daily calories from fat adjusted as follows :<30 changed to 27.5, 30-35 changed to 32.5, >35 changed to 37.5, 40-50 changed to 45.

^c RAPA PA Scoring: 1= sedentary, 2 = under-active, 3 = under-active, some light activity, 4 = under-active, some moderate activity, 5 = under-active, some vigorous activity, 6 = active with moderate activity, 7 = active with vigorous activity.

^d RAPA Strength and flexibility scoring: 1 = strength training at least once weekly, 2 = Flexibility training at least once weekly, 3 = both strength and flexibility training weekly.

Appendix J**Attendance**

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Average
Total participant attendance (n=12)	10 (83%)	11 (92%)	7 (58%)	9 (75%)	9 (75%)	8 (67%)	9 (75%)
Attendance of those not lost to follow up (n=9)	8 (89%)	9 (100%)	7 (78%)	8 (89%)	9 (100%)	8 (89%)	8.2 (91%)

Appendix K**Demographics**

Variables	Initial twelve participants N (%)	Final nine participants N (%)
Gender		
Female	11 (92.7)	8 (88.9)
Male	1 (8.3)	1 (11.1)
Ethnicity		
White	10 (83.3)	9 (100)
Hispanic/Latino	1 (8.3)	0 (0)
American Indian	1 (8.3)	0 (0)
Employment		
Part Time	2 (16.7)	2 (22.2)
Full Time	10 (83.3)	7 (77.8)
Education		
Diploma	1 (8.3)	0 (0)
Some College	8 (66.7)	7 (77.8)
College graduate	2 (16.7)	1 (11.1)
No data	1 (8.3)	1 (11.1)
Est. Annual Household Income		
<20,000	1 (8.3)	1 (11.1)
20,000 – 39,999	1 (8.3)	0 (0)
40,000 – 79,999	7 (58.3)	6 (66.7)
>80,000	3 (25.0)	2 (22.2)
Relationship Status		
Single	3 (25.0)	2 (22.2)
Married	8 (66.7)	6 (66.7)
Divorced	1 (8.3)	1 (11.1)
Household size (# of persons)		
One	4 (33.3)	3 (33.3)
Two	7 (58.3)	6 (66.7)
Six	1 (8.3)	0 (0)

Appendix L

Post-Intervention Questionnaire Responses

After being off sugar and flour for the first time in my life I felt fantastic!

Immediately after following the detox and meal plans, my head cleared and I no longer dealt with fogginess, dizziness and vertigo. As a result, I had more energy and began exercising regularly and taking vitamins. I also had stopped taking anti-depressants three weeks after starting them because I was feeling so good (physically and mentally) after going on the detox and after the Lord telling me to do so! It's been life changing, especially for these winter months.

I can bend over and tie my shoes without gasping for breath. Overall, I just feel good, like I haven't in quite a while.

I have improved spiritual focus and am desiring to draw closer to the Lord in a whole new way. I feel physically stronger and mentally more clear. I am looking to develop more social interaction in my life. I so appreciate the fellowship of others on the Daniel journey.

There is more to eating healthy than avoiding 'bad foods.' Learning and trying better alternative foods to replace the will expand the foods I can eat to keep me from getting bored and hungry for something tasty. Spending time with people who care about what they eat helps. A healthy lifestyle is crucial to keeping things in balance, this study has spelled that out and I am encouraged.

Working on being more disciplined with not eating after 8 pm, focusing on morning devotional time which sets my course. Lost some weight, that feels great. Feeling a freedom and joy in making good choices to eat more fruit and veggies. Enjoy feeling wise!

The most pleasant surprise and best takeaway is the 'safe' feeling of having my appetite under control without the 'desperation hunger' I'd felt at the end of my workday previously

Feeling better all around, clearer head, more bowel movements ☺, physically stronger, unity with my husband, working as a team towards better health.
