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Effectiveness of an Educational Intervention to Reduce Ageism in Undergraduate Students in an Entry-level Nutrition Class

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EFFECTIVENESS OF AN EDUCATIONAL INTERVENTION TO REDUCE AGEISM IN UNDERGRADUATE STUDENTS IN AN ENTRY-LEVEL NUTRITION CLASS

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ABSTRACT

Although the older adult population continues to increase, ageism remains an issue in the healthcare system and is prevalent among nutrition-related professionals. The aim of our study is to is determine the effectiveness of an educational intervention to reduce ageism among pre-healthcare professionals including Nutrition major students. Undergraduate students enrolled in an entry-level nutrition class were recruited and randomized into an intervention (INT) group (n=30) and a control (CON) group (n=29). The online educational intervention consisted of pre-recorded lectures and videos regarding ageism and myths regarding aging for the INT group, and on cultural competency and biases (other than ageism) for the CON group. After the online educational intervention, participants were asked to briefly describe what they learned from the lesson and submit their answers on Blackboard. Changes in ageism were measured at pre-, immediate-post, and 2-weeks post-intervention using the Fraboni Scale of Ageism (FSA), the Ambivalent Ageism Scale (Total AAS), AAS subscales including benevolent and hostile, and the Age Implicit Association Test. Mixed model analysis with repeated measures was used. Participants were mostly female (n=55), white, non-Hispanic (n=37), and in their second year of school (n=25). Although age was significantly different between groups (about 22 vs 20 years in INT vs CON, respectively), age did not correlate with any of the ageism scores ($p>0.05$). There were no significant group-by-time interactions for any of the ageism scores ($p>0.05$). However, in the simple effect analysis per group, perceived “old-age” cut-off increased significantly, while

FSA, total AAS, and AAS-hostile subscale scores decreased significantly, and these changes remained significantly low at 2 weeks ($p<0.05$). Qualitative data analysis also supported this finding with statements made by participants in their answer submissions. However, no significant changes were observed in ageism scores in the CON group over time ($p>0.05$). Findings from this study are suggestive that our online educational intervention may be useful in reducing ageism among undergraduate nutrition and dietetic students. However, larger-scale randomized studies are needed to confirm our findings.

DEDICATION

I would like to dedicate this thesis to my advisor, Dr. Nadeeja Wijayatunga. This study and thesis would not have been possible without her guidance. I have learned so much from her about the research process. I am so grateful for her encouragement, patience, and support during this process. She has encouraged me to strive for success and I am so thankful for her wisdom and guidance. I would also like to dedicate this thesis to my mom, Fran, my dad, Jimmy, and my sisters, Katelyn and Kimberly. My family has been my inspiration throughout my journey as an undergraduate and graduate student. They have been so supportive and understanding during my time completing this study. My parents have always reminded me that with dedication, focus, and patience, I am capable of achieving my goals. I appreciate their love, patience, and support.

LIST OF ABBREVIATIONS AND SYMBOLS

AAS	Ambivalent Ageism Scale
AAS-benevolent	Benevolent Subscale of the Ambivalent Ageism Scale
AAS-hostile	Hostile Subscale of the Ambivalent Ageism Scale
AgeIAT	Age Implicit Association Test
CON	Control group
FAQ	Facts on Aging Quiz
FSA	Fraboni Scale of Ageism
IAT	Implicit Association Test
INT	Intervention group
NDTR	Nutrition and Dietetic Technicians, Registered
RD	Registered Dietitian
RDN	Registered Dietitian Nutritionists

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CHAPTER I

INTRODUCTION

According to the 2016 American Community Survey Report, the total number of adults aged 65 years and more in the U.S. population was 49,220 and 21.9% of them were in the labor force [1]. It is expected that by 2030 older adults will account for 21% of the U.S. population. By 2060, the 85 years and above population may reach 20 million [2]. By 2030, all baby boomers will be older than 65 years, which will expand the size of the older population so that one in every five residents will be in the retirement age. By 2034 there will be 77.0 million people 65 years and older compared to 76.5 million under the age of 18 years. The median age of the U.S. population is expected to grow from age 38 today to age 43 years by 2060 [3]. The elderly population is the fastest-growing age group in the U.S., and there is an increasing demand for better elderly care [4, 5]. The older adult population is often overlooked and neglected. We need to take this demographic transition into account and make societal changes to harness the contributions that older people make to development and ensure that they are not left behind [6].

From 2014-2017, adults 60 years of age and older embodied 43 emergency room visits for every 100 persons visiting the emergency room. For adults 60 years and older, about 7% of emergency room visits were nursing home residents, and about 30% of patients 60 years of age and older arrived at the emergency room by ambulance [7]. After conducting interviews and focus groups with doctors and nurses, researchers learned that elderly patients were less of a

priority compared to younger patients and received different treatment than younger patients received [8]. A goal of Healthy People 2020 is to improve the health, functionality, and quality of life of older adults. In order to accomplish this, we need to understand the intricacy of nutritional risk of the older adults living in the community and identify the gaps in information that display the results of food and nutrition programs for older adults. We also need to acknowledge the unique roles and responsibilities of registered dietitian nutritionists (RDNs) and nutrition and dietetic technicians, registered (NDTRs) in advocacy, leadership, and education, and suggest ways to highlight the importance, effectiveness, and funding of these food and nutrition programs [9, 10]. RDNs and NDTRs are essential in accomplishing these goals. Understanding the elements that affect the nutritional status of older adults is vital. RDNs and NDTRs need to understand how to collaborate with the state and federal community-based food and nutrition programs that assist older adults [11].

Ageism is characterized as having a prejudice, stereotyping, or discrimination against a person because of age [12]. Ageism is a form of intergroup bias that can be expressed explicitly (consciously) and implicitly (unconsciously) [13, 14]. Reports indicate that implicit ageism is even more common than implicit sexism and racism [15]. One of the most stereotyped social groups is the older adult population [16, 17]. Older adults are often depicted by younger adults as an impending burden [13]. Ageism can be expressed at different levels including, at the individual level, through social networks, and at the institutional or cultural level [14]. Ageism is a vastly prevalent form of discrimination that is unlike other forms of discrimination because it is unchallenged, socially accepted, and is a common form of discrimination that is held across many societies. Language and media, including films, television, popular music, print, and social media, most often echo and reinforce these stereotypes, because ageist depictions tend to be the

norm [18-20].

As we get older, not only do we experience ageism from others, but we experience it from ourselves because of the unconscious internalization of society's negative attitudes and stereotypes towards older people [21]. In the U.S., ageism persists; and discrimination against older adults exists in all types of settings, including the healthcare system. Older adults may even face discrimination in their place of employment [22, 23]. There is an extensive amount of research that confirms the high prevalence of ageism across multiple countries [24] and that this problem will continue to increase [25]. In North America, 91% of older adults from Canada and 85% of older adults from the U.S. reported that they have experienced ageism during their life [26].

It is essential to investigate the role that community-based educational interventions play in addressing and diminishing negative stereotypes and attitudes toward older adults [27]. In order to minimize the negative impacts of ageism, it is necessary to identify the factors that contribute to negative ageist attitudes [14]. Interventions to reduce ageism are rare, have questionable results, and may lack a framework or educational intervention to reduce ageism [28].

To our knowledge, past studies have not explored educational interventions on reducing implicit ageism in undergraduate nutrition and dietetics students using a randomized control trial. The overall aim of the current study is to develop an effective educational intervention to reduce ageism among pre-healthcare professionals including students majoring in nutrition and dietetics. The first objective of the current study is to determine the effects of an online educational intervention that addresses knowledge of ageism, myths about aging, and induces empathy on changing explicit bias and implicit bias related to aging among undergraduate students in an

entry-level nutrition class. The second objective is to determine the effects of an online educational intervention that addresses knowledge of ageism, myths about aging and induces empathy on changing the perception of "old age" among undergraduate students in an entry-level nutrition class. We hypothesize that explicit and implicit ageism will be reduced immediately in the students following an educational intervention discussing ageism and its negative effects; and will persist up to 2 weeks following the educational intervention. We also hypothesize that the perceived "old age" cut off will increase among the undergraduate students following the educational intervention and will continue up to 2 weeks later. To test our hypothesis, we conducted a parallel-arm randomized study which included two different online educational interventions and three data collection time points, pre, immediate-post, and 2-week post surveys.

CHAPTER II

REVIEW OF LITERATURE

Impacts of Ageism

Encompassing negative attitudes and stereotypes toward older adults is usually an obstacle to possessing effective, therapeutic relationships with older adults [29]. Everyone ages and will most likely become a part of the older adult population. So, discrimination against older adults is discrimination against your future self [21]. Younger adults tend to just assume that all older adults are grumpy, miserable, friendless, lowly, senescent, ill, unintelligent, unappealing, and incompetent or inefficient [23, 30-32]. It is imperative to inform university students about older adults and aging in order to debunk these myths and damaging stereotypes about aging [33, 34]. According to Abrams [35], Levy, Slade [36], older adults that are subjected to adverse opinions of aging do not function as well on cognitive tasks, have shoddier health, and live a shorter life.

Older adults may be shunned, intimidated, belittled, victimized, discriminated against at work, and abused physically [23, 24, 37-40]. According to the World Health Organization (WHO), elder abuse can be a single or repeated act. Elder abuse occurs when there is physical abuse, a lack of proper care, and exploitation between the person(s) responsible for taking care of an older adult and the older adult [41]. Neglect and financial exploitation are the two most common forms of elder abuse; most of which come from family members, a close friend, or a

caretaker [42, 43].

Ageist attitudes and inequitable practices in the healthcare system can lead to negative health consequences and can place older adults at risk. Negatively stereotyping older adults has been acknowledged as an enduring stressor for older adults and compromises health. These attitudes also affect the quality of care that older adults receive, which can negatively affect health outcomes [44]. The quality of health and social care and the development of beneficial policies for elder health may be limited and negatively impacted by negative ageist attitudes [6]. Possessing negative attitudes on aging can lead to a shorter lifespan, cause individuals to recover from disability at a slower rate, and decrease social assimilation [21]. Researchers have found that age discrimination and negative attitudes toward older adults are related to higher levels of psychological distress, symptoms of depression, social seclusion, and diminished life satisfaction [45-48].

Types of Ageism

Ageism involves benevolent and hostile attitudes toward older adults [49]. Benevolent ageism is a form of ageism that includes over-compensation and overly positive attitudes toward older adults. When people exhibit benevolent ageism, they are often "babying" older adults because older adults are frequently thought to be kinder than younger adults or tender, but incompetent and less able to take care of themselves. Elderspeak is a common way that benevolent ageism is exhibited. Elderspeak is speaking to older adults in a way that assumes their incompetence or limitations by speaking louder, slower, and using "baby talk" to speak to adults [50, 51]. The effects of "elderspeak" differ among older adults. Reports suggest that older adults with decreased functional ability show more positive responses to elderspeak Caporael, Lukaszewski [51]; however, it is more likely that this type of speech leads to negative outcomes

for older adults. Over time, older adults may come to accept the implications of elderspeak and perceive themselves as less competent and less capable; which increases their dependence and encourages condescending behavior toward older adults [52-55]. It is important that older adults feel that they are in control of themselves and are not patronized or belittled. Giving older adults more responsibility has been shown to lead to better health results than adults that are given little responsibility [56]. Exhibiting behaviors of over-accommodation can cause older adults to lose self-esteem, incentive, self-assurance, and a sense of control. People that exhibit high benevolent ageist behaviors may treat older adults in a more positive manner that may be patronizing [52, 54, 57, 58]. People that exhibit more hostile ageist behaviors may be prone to treat older adults in a more negatively [49].

Bias is comparing one group negatively in relation to another group. Bias can be explicit and implicit [59]. Implicit and explicit ageism are variables that we measured in the current study. When an individual has an explicit bias, the individual is aware of that bias or discrimination and it manifests in that person's everyday actions and conversations. It is intentional and the individual believes that it is correct [60-62]. Implicit ageism is subtle and is reflected through thoughts, feelings, and memories of older adults that an individual is not consciously aware of [60]. Implicit bias is an unconscious judgement of a certain group and although it may be subtle or unintentional, it still reinforces negative stereotypes and encourages exclusion. It is hidden, which makes it very difficult to measure and control [62, 63]. Although it is more difficult to recognize than explicit ageism, recognizing and identifying implicit ageism is possible. The Implicit Association Test (IAT) (Millisecond, Seattle, WA), which was used in the current study, was developed to measure implicit biases and is very successful [64].

Ageism and Undergraduate Students

There are several past studies exploring ageism in undergraduate students and these are summarized in Table 1. A study by Gendron and Lydecker [65] examined the relationship between body consciousness, body image, aging anxiety, ageism, and gender. The relationship between anxiety about aging and ageism in relation to body dissatisfaction was examined; and these variables were further examined based on gender. Higher body surveillance, body shame, appearance control, and body image avoidance were found to be associated with higher concerns about aging. The researchers found that males exhibited more ageism and had more fear of old people, but females showed more anxiety toward aging in relation to their appearance [65]. Allan and Johnson [66] researched the relationship between attitudes about aging and anxiety about aging among 113 undergraduate students. They found that participants who had more knowledge about aging showed lower levels of anxiety and ageism. They also found that older participants and participants who showed less anxiety about aging tended to be less ageist. Participants who had daily interactions with older adults at work showed lower levels of anxiety, and participants who had daily contact with older adults at home showed higher levels of anxiety [66].

Bergman, Erickson [67] conducted their study to determine variables related to undergraduate student's interest level in topics related to aging, a career in gerontology, and level of understanding of educational and professional opportunities involving older adults and aging. Students who reported a higher level of interest in a future career in an older adult setting were also found to have completed more coursework on aging, had less aging anxiety, lower ageism scores, participated in aging-related experiential learning, had more frequent contact with older adults, and had better quality formal contact with older adults. The students who believed that there was an ample number of existing professionals in the field were found to have higher levels

of ageist beliefs. The students who were found to have more knowledge of what they could do with an aging-related degree were females and students who had participated in more aging-related coursework. Researchers concluded that students should receive frequent formal interaction with older adults and participate in aging-related coursework [67].

A study was conducted to examine the relationship between ageism and knowledge about aging, anxiety about aging, contact with older adults, and level of compassion among undergraduate students training for careers in helping professions. Researchers found that those who were more educated about the aging process tended to report less ageism. Trainees who reported higher anxiety about aging tended to report higher ageism, and individuals with more compassion were found to be less ageist. Researchers also found that the quantity of contact with older adults did not significantly predict ageist attitudes, but the quality of contact with older adults was more impactful on student's attitudes toward older adults [68].

Due to the lack of research that examines undergraduate's daily behavior toward older adults, Stahl and Metzger [69] aimed to assess ageist behavior among undergraduate students enrolled in a human development course by examining perceived vulnerability to disease and knowledge about aging. According to the researchers, this study was the first to provide evidence that perceived susceptibility to infectious disease is linked to negative ageist behaviors. Researchers found that undergraduates who regarded themselves as more vulnerable to disease reported more negative ageist behavior. They also found that undergraduates who had less knowledge about aging tended to report more negative ageist behavior. The researchers mentioned that the relationship between knowledge about aging and ageist behavior was stronger for males [69].

Ageism in Healthcare

For the growing number of older adults, the shortage of healthcare professionals specializing in geriatrics and gerontology is concerning [70, 71]. Less than 5% of healthcare professionals are licensed for geriatric care; and many healthcare providers allow these credentials to lapse [72, 73]. Geriatricians possess many skills that other healthcare professionals lack [74]. They are trained to understand the unique physical ailments that older adult patients suffer from, how to address patient fears, and deliver counseling and care to patients who are dying [75]. Strategies to increase the number of healthcare physicians dedicated to geriatric research are essential [76]. A lack of preference for this specialty among students majoring in healthcare fields has been reported in past research [77-82]. The attitudes that health professionals have toward older adults and knowledge about aging greatly influence the quality of care that the older patients receive. Using restraints on older patients and not including them in making decisions regarding their care have been issues reported among health care professionals [83]. There is copious evidence of ageism in the healthcare system [84]; which may put older patients at a greater risk of death than younger patients [85, 86].

There are several studies exploring ageism in healthcare and pre-healthcare professionals. Previous studies have found that medical students who have cared for older adults preceding medical school had more positive attitudes toward older adults and were more interested in geriatrics [87]. Changing medical students attitude's toward older adults has been the focus of past educational programs [88-93], but few interventions have aimed to increase geriatric research [76]. When healthcare professionals have negative feelings toward a certain group, it affects the quality of care given to that group [94, 95]. Older adults are often discriminated against and perceived as a burden or dependent because of assumptions about older adults that

are often created from outdated stereotypes [96]. Ageism contributes to reduced interactions between health care professionals and older adults; as well as limiting their involvement in decisions regarding care [97-100].

Kydd and Fleming [101] reviewed the literature to determine if ageism exists in the healthcare system. The three trends that were found within the literature were: the type of discrimination, the altering status of hospitals, and social value versus compassion. A common theme among the articles was the negative stereotypical views of older adults, such as weakness, dependence, and non-productive. There were reports that hospitals specializing in elderly care were being closed and replaced by large acute care hospitals; which means that specialized care for this age group has decreased while the number of older adults continues to increase. Age discrimination in health care has been found to lead to reduced compliance, increased risk of depression, and inferior health outcomes. The authors also mention that older patients with complex needs, who require more long-term care were viewed as bothersome to health care staff who were more focused on early discharge [101].

Nutrition and Dietetics Students and Ageism

Malnutrition, stroke, cancer, dementia, obstructive pulmonary disease, and heart disease are health issues that are common among the older adult population and often require the involvement of a dietitian [102]. According to the Committee of the Institute of Medicine, registered dietitians are the most certified health professionals to provide nutritional services to older adults. Registered dietitians have more opportunities to deliver medical nutrition therapy to older adults after the medical nutrition therapy protocol care bill (MNT-PC) was passed [103-105]. Although nutrition is a critical part of preventing and treating chronic diseases common among older adults, nutrition students continue to have the same attitude and dislike for working

with older adults. This problem needs to be examined in depth [106, 107]. Registered dietitians that are eager to work with older adults help create nutrition programs for older adults, organize research in geriatric nutrition, and promote nutrition health policies that are needed for the older adult population [108].

Cha and Seo [109] conducted their study to determine dietetic student's knowledge, attitude, preference to deliver nutrition assistance to older adults, and the variables that influence dietetic student's preference or lack of preference for working with older adults. Results indicated that attitudes toward older adults were more favorable among U.S. college students than Korean students. It was also found that education about aging, recurrent interaction with older adults, and internship and residential experience made no significant difference in knowledge about aging for Korean students; but knowledge about aging was significantly higher among U.S. students following internship experience with older adults. For U.S. students, no relationship was found between knowledge about aging and the elderly, previous experiences, and attitudes; but negative relations were found between knowledge and attitudes toward emotion for older adults, and between knowledge and positive attitudes toward working with elderly employees [109].

A study including dietetic students from American universities has established a lack of knowledge about aging, as well as a low preference for working with older adults Researchers involved in the study believe that improved education about aging should be required among dietetic students [106]. Another study found that scores among students studying nutrition and dietetics improved after completing an educational intervention with older adults that confronted the student's stereotypical perceptions of older adults. The intervention was shown to have a positive effect on students' preference for working with older adults [110]. A study intended to

establish the attitudes, intelligence, and preference of dietetic students located in the United Kingdom (UK) in regards to working with older adults. The researchers of this study found that UK dietetic students were significantly more knowledgeable about aging than American dietetic students. They also found that there was a slight pro-aged bias and a low preference for working with older adults among the UK dietetic students [4].

Kaempfer, Wellman [106] aimed to determined if there was a relationship between dietetic student's knowledge and attitudes about aging and their level of preference for working with older adults. They surveyed dietetic students enrolled in the 10 largest American universities in the 5 states with the largest population of older adults. It was found that the score for knowledge about aging was lower for dietetic students than other disciplines. It was also found that the dietetic students had neutral attitudes toward older adults and reported working with older adults as their least preferred age group to work with. An emphasis on aging in the curriculum is essential for the future of nutrition and dietetics [106]. More information about the literature regarding nutrition and dietetics students and ageism can be found in Table 1.

Past Educational Interventions on Ageism

Previous studies have discovered that increased accurate knowledge of aging is associated with increased positive attitudes toward older adults (Table 2). Also, improvement of negative attitudes toward adults can be achieved through education [111]. One study examined 3 types of interventions that are designed to reduce ageism: education, intergenerational interaction, and a combination of education and intergenerational interaction. It was found that educational interventions aimed to reduce ageism showed a sizeable effect on opinions and knowledge, and comfort; but did not show a great effect on anxiety or working with older adults. Combining education interventions and intergenerational interaction had the most significant

effect on ageist attitudes [112]. In their study, Jeste, Avanzino [76] aimed to examine the efficacy of two summer research programs to improve medical student's attitude toward aging. Researchers found that a research training program aimed at increasing geriatric research significantly improved early interest in geriatrics, compassion, attitudes toward a career in geriatrics, and ageism [76].

The deficit of knowledge about aging, negative attitudes, and lack of preference in working with older adults among health professionals could be the reason for such a low number of health professionals in geriatrics. One study implemented a guided experimental assignment where nutrition students conducted three client interviews and were randomly assigned to either an older adult or a younger adult. They were asked to create a report responding to reflective questions about the change in attitude, values, and self-efficacy in working with older adults. Results indicate that in regard to attitudes toward older adults, the intervention group scores increased significantly compared to the comparison group. Researchers concluded that the guided experimental assignment was effective in improving attitudes toward and self-efficacy in working with older adults [110]. Chen, Kiersma [113] examined empathy, perceptions, and game experiences among pharmacy students after participating in an aging simulation game. Researchers found that student's empathy and attitudes toward older adults improved after participating in the simulation game [113].

A study conducted as dissertation research examined whether knowledge about older adults can increase undergraduate student's interest in working with older adults [114]. This was a non-randomized study that consisted of one experimental group. The Facts on Aging Quiz Revised and the "Myths and Realities of Aging" were used for the educational intervention. The educational intervention was 20-minutes long, included facts about older adults and aging, and

aimed to debunk common myths about aging and older adults that students may possess. The Facts on Aging Quiz and the Ambivalent Ageism Scale were used to measure knowledge of older adults and ageism. Following this educational intervention, participants' knowledge regarding older adults and willingness to work with older adults increased, while ageist attitudes decreased [114].

Researchers Ermer, York [27] used intergenerational performing arts interventions in their study. The goal was to determine if this type of intervention would increase knowledge on ageism, cause participants to view ageism as a problem, change participant's perception on ageism, and decrease ageist stereotypes. Although participants were not randomized, the study included 2 groups. The experiment group attended the performance that followed a discussion, and the control group attended the performance that was not followed by discussion. Participants attended two performances. One performance included two skits performed by the Mental Health Players. One skit was about an older couple that was excluded from neighborhood activities because of their age. The second skit included two friends discussing how one of their adult children was too concerned about his/her older parent doing activities alone. A discussion by a trained moderator followed this performance. The second performance was part of the ChangingAging Tour. This performance included performance art, nonfiction storytelling, and live music to address stereotypes about aging, death, and dementia. They found that only participants under 50 years of age reported a substantial increase in viewing ageism as a problem after the intervention. They found that only those that participated in the discussion program who were under 50 years of age experienced an increase in belief in their ability to change their perception on ageism between pre- and post-tests. Researchers also found that positive views on aging increased and negative stereotypes decreased significantly between pre- and post-tests,

regardless of age and program type [27].

Lytle and Levy [115] conducted two studies that aimed to test the Positive Education about Aging and Contact Experience (PEACE) model. The PEACE model is a theoretical model that intends to reduce ageism by concentrating on tutelage about aging and positive interactions with older adults [116]. Researchers Lytle and Levy [115] conducted these two studies to examine whether offering accurate facts about aging, familiarity of intergenerational interaction, and the effect that both of these factors have when combined on reducing ageism. Both studies included an online intervention where participants were divided into three groups and asked to answer true/false questions. Education condition participants received factual information after answering questions. Extended contact condition participants received descriptions of intergenerational relationships. After answering the survey questions, combined condition participants were given both explanations and control condition participants were given more detail about wallpaper questions. Study 1 was an online study including 354 undergraduate students Compared to the control, participants in the intervention group showed fewer negative attitudes toward older adults and increased knowledge of older adults. They also reported an increase in support of positive age stereotypes and decreased negative age stereotypes. Education about aging actually caused participants to be more anxious about aging. Study 2 was an online study including 505 community participants ages 18-59 years. Participants in the experimental group reported reduced negative attitudes toward older adults and increased knowledge about aging. Both studies suggested that education about ageism can be effective in reducing ageism. Providing facts about aging and extended interactions with older adults were shown to improve attitudes toward older adults and improve knowledge about aging [115].

Education about aging has been indicated to be effective in decreasing ageism [117-119].

Wurtele and Maruyama [111] conducted a study using undergraduate students participating in a lifespan human development course. They were instructed to think about activities that older adults may take part in and write down five of those activities. During the next class, the students were provided accurate facts about older adults. An immediate post-test revealed a reduction in ageism following the presentation of accurate information regarding aging and a discussion on ageism. Lytle, Nowacek [120] used an educational intervention called “Instapals” that incorporated both aging education and intergenerational contact on undergraduate students to reduce ageism. Part 1 included education about ageism. Participants watched a TED talk about ageism, an expert speaker discussed ageism with class, and the class watched several more videos. Participants then created a 3-part poster series on anti-ageist behaviors and designed their own “old person in training” t shirts. Part 2 included intergenerational contact. Participants created presentations about Instagram to introduce the social media platform to older adults at OATS (older adult technology services) to Instagram. Participants also had 30 minutes of conversational time with their OATS volunteer. Older adult and undergraduate shared Instagram posts for the next 30 days. The participants had more positive attitudes toward aging and older adults after their experience with Instapals [120]. More information about the literature regarding past educational interventions to reduce ageism can be found in Table 2.

Table 1: Past Studies Exploring Ageism Among Pre-healthcare and Healthcare Professionals*

Author	Population	Tools used to assess ageism	Findings
Allan and Johnson [66]	113 undergraduate students at a Canadian University. Ages ranged from 17-49 years of age.	Fraboni Scale of Ageism (FSA), Aging Anxiety Scale, Facts on Aging Quiz (FAQ)	Participants with more knowledge about aging exhibited less ageism. Participants with less anxiety exhibited less ageism.
Gendron and Lydecker [65]	485 college students (18-25 years) enrolled in psychology courses at a large, Mid-Atlantic public university.	Aging Anxiety Scale, FSA, The Objectified Body Consciousness Scale, The Body Image Avoidance Questionnaire	Higher body surveillance, shame, appearance control, and body image = more aging anxiety. Males = more ageism and fear of old people. Females= more aging anxiety.
Bergman, Erickson [67]	300 college students (18-50 years) enrolled at a medium-sized comprehensive college in the northeast U.S. Participants were majoring in business, music, humanities and sciences, communications, health sciences, interdisciplinary, and graduate and professional studies.	(Used own questions to determine aging coursework and contact with older adults.) FAQ Aging Anxiety Scale 29 item FSA	Aging-related coursework and formal contact with older adults = greater interest in learning about and working with older adults, as were lower levels of anxiety and ageism. Experiential learning = greater interest in aging-related careers. Females and those who have studied aging had greater knowledge of the opportunities that exist in the field of gerontology. Lower levels of ageism = knowledge of the labor force shortages in aging-related fields.
Boswell [68]	47 undergraduate students (18-37 years) training for a career in health care enrolled in 2 sections of a junior-level course on aging at a small, south-central U.S. university	29 item FSA, FAQ, Aging Anxiety Scale, Santa Clara Brief Compassion Scale (participants rated degree of contact with older adults)	Greater knowledge of aging = less ageism Higher aging anxiety = higher ageism Higher compassion = lower ageism Quantity of contact with older adults = no relation to ageism Quality of contact with older adults = linked to student's attitude toward older adults

Note * These studies did not include any intervention to reduce ageism

Table 1: Continued

Author	Population	Tools used to assess ageism	Findings
Stahl and Metzger [69]	649 undergraduate students (18-60 years) enrolled in a human development course at a large mid-Atlantic university.	Perceived Vulnerability to Disease Questionnaire, FAQ, Relating to Old People Evaluation (ROPE)	Perceived susceptibility to disease = ageist behavior more perceived susceptibility to disease and less knowledge about the aging process = more negative ageist behavior Association between aging knowledge and ageist behavior = stronger for males
Cha and Seo [109]	119 American dietetic students at a Midwestern state in the U.S. and 125 Korean college dietetic students in Seoul, South Korea.	Knowledge about aging was based on studies by Kline, Scialfa, Stier, and Babbitt (1990). The attitudes and behavioral intentions statements were developed based on Dorfman, Murty, Ingram, and Evans's study (2002). Students were asked if they had frequent contact with people older than 65.	The results show that knowledge about aging and the elderly, coursework experiences, and internship experiences are much greater among American college students than among Korean college students. Stepwise regression results found positive attitudes toward working for the elderly, as well as internship experiences, influenced behavioral intentions among both Korean and U.S. students.
Kaempfer, Wellman [106]	299 undergraduate nutrition and dietetic students from the 5 states with the largest population of older adults (California, Florida, New York, Texas, and Pennsylvania)	FAQ, Oberleder attitude scale	Students had low knowledge about aging and neutral attitudes toward older adults. The students ranked the 3 oldest age groups to work with as their least preferred age groups to work with.
Mackenzie and McAulay [4]	285 students from the 15 universities that provide nutrition and dietetic courses in the U.K.	Facts on Aging Questionniare	UK dietetics were significantly more knowledgeable about aging than American dietetic students, there was a slight pro-aged bias, and students reported a low preference for working with older adults

Note * These studies did not include any intervention to reduce ageism

Table 2: Past Studies Involving Interventions to Reduce Ageism

Author	Population	Intervention	Tools used to assess ageism	Findings
Ermer, York [27]	72 individuals ages 20-89 recruited via community newsletter, word-of-mouth, and gerontology classes at a northeastern university.	Intergenerational performing arts intervention addressing age.	The Image of Aging Scale. To measure ageism as a problem in the US, researchers included one question, 'Is ageism a problem in the US?'. To measure the change in perceptions about ageism, the researchers included one question, 'To what extent do you think you could change perceptions about ageism?'.	Participants < 50 years reported increase in perceiving ageism as problem in US. Participants of discussion group < 50 years reported increase between pre- and post-test in belief that they could change perceptions about aging. Positive views increased; negative stereotypes decreased (regardless of program type and age).
Jeste, Avanzino [76]	134 medical students	2 summer research training programs combining mentored research, didactics, and some clinical exposure.	Carolina Opinions on Care of Older Adults (COCOA)	COCOA scores improved substantially after program.
Chen, Kiersma [113]	156 first-years pharmacy students in their first professional year of pharmacy school (19-48 years)	Aging simulation game.	Kiersma-Chen Empathy Scale (KCES), Jefferson Scale of Empathy-Health Professions Scales (JSE-HPS), Aging Simulation Experience Survey (ASES)	Empathy improved significantly.
Lytle, Nowacek [120]	14 undergraduate students drawn from a design course taught by one of the coauthors	The name of the intervention is Instapals. Part 1: education about ageism. Part 2: intergenerational contact.	8-item measure of stereotyping of older adults, 5-item measure of affective attitudes toward older adults, 4-item measure of aging anxiety, 5-item measure of psychological concerns about aging, open-ended responses	After experiencing Instapals, the participants had more positive attitudes toward aging and older adults.

Table 2: Continued

Author	Population	Intervention	Tools used to assess ageism	Findings
Lytle and Levy [115]	Study 1: 354 undergraduate students Study 2: 505 community participants (18-59 years)	(Includes 2 studies) Online intervention. Students were divided in 4 groups (3 experimental and 1 control) and asked to answer true/false questions.	Study 1: 22-item Fraboni ageism measure, participants rated positive and negative age stereotypes, Feeling Thermometer, 4-item Aging Anxiety measure, 3-item Anxiety about Interacting with Older Adults measure, 5-item Behavioral Intentions measure, Anti-age Discrimination Petition, FAQ Study 2: included the same measures except for Anti-Discrimination Petition	Study 1 and 2: Compared to control condition participants, experimental condition participants exhibited greater knowledge and fewer negative attitudes toward older adults. Experimental condition participants showed increased endorsement of positive age stereotypes in the immediate post-test compared to control condition participants. Study 1: Experimental condition participants showed a decrease in endorsement of negative age stereotypes in immediate post-test compared to control condition participants. Study 2: Experimental condition participants showed fewer negative attitudes in the immediate post-test compared to control condition participants.
Lee, Hoerr [110]	100 college students from an upper-level community nutrition course at a large, north-central land-grant university. Most students majored in dietetics or nutritional sciences or were double majors.	Intervention included 3 client interviews and a project report after those interviews that asked participants to respond to reflective questions	FAQ, The Wall-Oyer Aging Inventory	Intervention group scores regarding attitudes toward older adults increased significantly compared to the control group. The assignment was effective in improving student's attitudes toward older adults.

Table 2: Continued

Author	Population	Intervention	Tools used to assess ageism	Findings
Kelley [114]	207 undergraduate students from Southeastern University	20-minute educational intervention included the FAQ Revised and "Myths and Realities of Aging".	FAQ, AAS, Five Factor Model Rating Form (FFMRF), 7-point, 28 Likert-type scale with various anchors was used to measure willingness, comfort, and desire to work with older adults	After educational intervention, participants reported an increase in knowledge, increase in willingness to work with older adults, and decrease in ageist attitudes.
Wurtele and Maruyama [111]	Undergraduate students in a lifespan human development course at the University of Colorado at Colorado Springs	Students jotted down 5 activities that they think older adults do to spend their time. Students were then given actual facts about how older adults spend their time to counter these stereotypes.	23-item FSA	Following intervention, stereotype subscale scores decreased. Separation and Affective Attitude subscale scores did not change significantly following the intervention.

CHAPTER III

METHODS

Participants

Participants recruited for this study were undergraduate students enrolled in an introductory nutrition class (NHM 311) for the Fall 2020 semester, taught by three different instructors at the University of Mississippi. Inclusion criteria were 18 years or above and enrolled in one of the NHM 311 courses. Study participants were recruited through emails and Learning Management System (Blackboard). One hundred and nineteen students were invited to participate in the study. A screening survey was administered using Qualtrics (Qualtrics, Provo, UT), where participants were instructed to create their unique study ID to use throughout the study. Eligible participants were randomly assigned to either the Intervention group (INT) or the Control group (CON).

Ethical Concerns

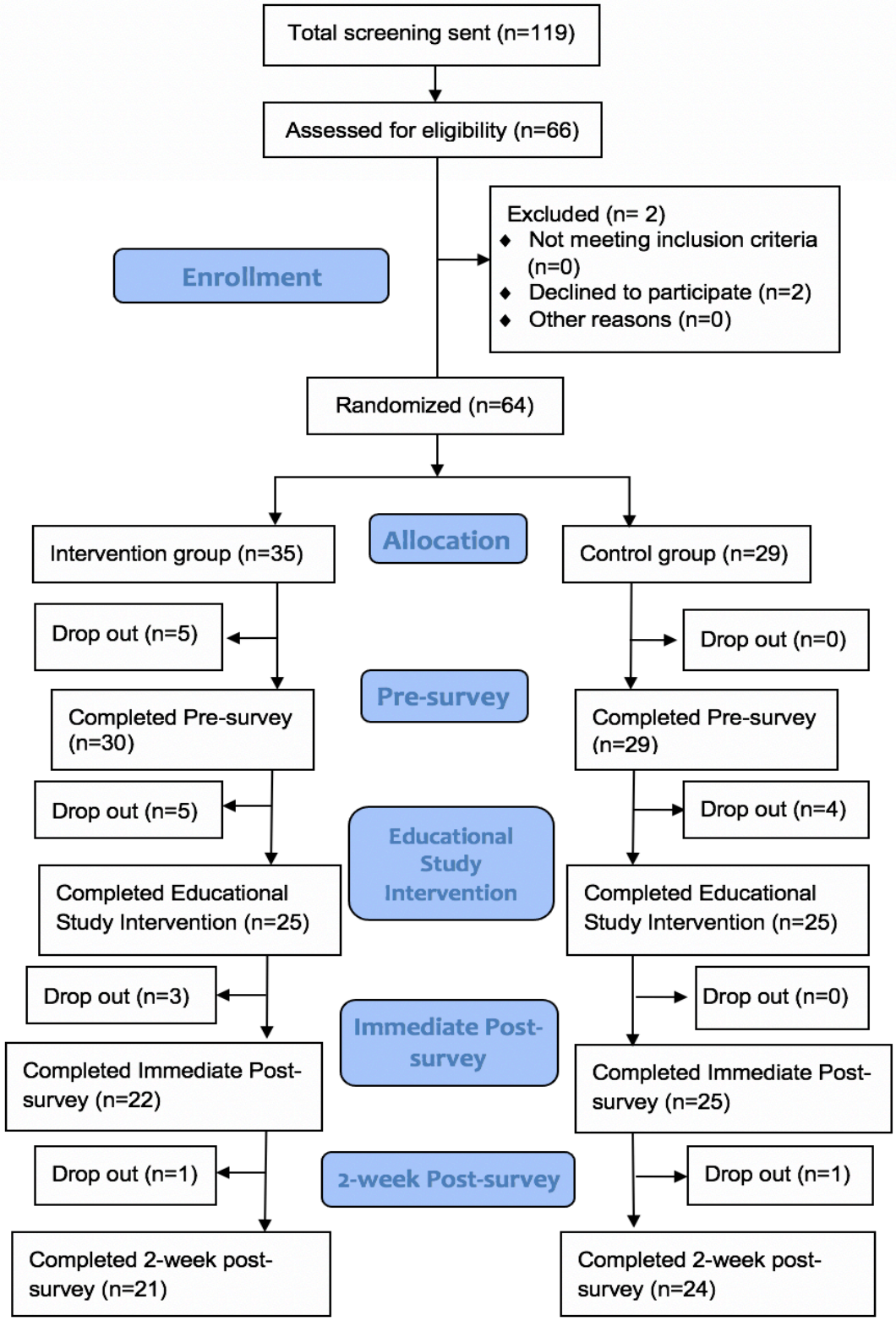
The study was approved by the Institutional Review Board (IRB), and the protocol number is 21x-046. An information sheet providing a short description of the study and the steps involved was included in the screening survey provided to the participants. Participants who completed the study received extra course credit points. If students preferred not to volunteer for the study, they were given comparable alternative assignments to receive the same amount of extra credit. The research question was not conveyed to the participants at the beginning of the

study. Thus, after the study was completed, a debriefing statement was emailed to all participants who completed the pre-survey explaining the study aims. Also, all the participants were granted access to both educational study intervention material once the data collection was completed. The study is registered at clinicaltrials.gov (NCT04570917).

Study Design

In our study, eligible participants were randomized to INT and CON groups using simple randomization. The period of enrollment began on September 28, 2020, and ended on October 15, 2020. This study included three online surveys and two different online educational interventions for the INT and CON groups. Following the initial screening, eligible participants first completed the pre-survey questionnaire. Next, participants completed the online educational intervention which had different content according to the group allocation. Immediately after reviewing the online learning activities on Blackboard, participants were instructed to complete the post-survey questionnaire. The online educational intervention and the immediate post-survey were made available on October 11, 2020 and ended on October 20, 2020. The final step was the 2-week post-survey which ended on November 11, 2020. A summary of the study design and study participant recruitment is shown in Figure 1.

Figure 1: Summary of the Study Design and Study Participant Recruitment



The Intervention

The online educational intervention consisted of multiple short videos and a short writing assignment administered via Blackboard. Both groups had a similar structure for the educational intervention but with different content. The total duration to complete watching the videos in the educational interventions was about 20 minutes for both groups.

The INT group educational intervention consisted of 6 videos and the objective was to provide knowledge about ageism, debunk myths regarding aging, and induce empathy for older adults. Details of the videos used are described below in Table 3. For the CON group, the objective of the educational intervention was to teach the group about the importance of cultural diversity in dietetics and consisted of 6 videos, and those are described in Table 4. This material did not include any aspects that were related to older adults.

At the end of the educational study interventions, the participants in both the INT and CON groups were asked to "Briefly describe what you learned from the lesson." and submit their answer on Blackboard. This was included for several reasons: to assess if the participants watched the learning material, to identify any negative feedback regarding the quality of the videos, and to add a component of critical thinking to the learning activity.

Table 3: Details of the Videos Used for the Educational Intervention for the Intervention (INT) Group

Video Title	Duration	Content Covered	Web link
Myth busting video	3.31 minutes	Dialogue between two individuals based on the Facts on Aging Quiz [121]. Eight myths regarding aging were discussed.	Video created by the researchers
Ageism lecture	7.48 minutes	Highlighted that the U.S. population is aging. Defined ageism and discussed the negative impacts of ageism on older adults. Discussed the problems due to ageism in healthcare/nutrition. Discussed that ageism is increasing during COVID times and that COVID-19 is not a problem of older adults.	Video created by the researchers
"Are Our Perceptions of Age Distorted?" video	3.44 minutes	The creators of this video set out to see if subconscious ageism existed. Three focus groups of younger adults were asked to cast ads. They were asked to choose candidates for the ads from photos of older adults and younger adults. The older adults watched this process live on video in another room. Later, both groups were allowed to interact.	Video created by Apia Australia https://www.youtube.com/watch?v=mwNjYe7MM7Y
"Ageism is All Around Us – Hear How it Affects Older People Around the World"	2.25 minutes	Older people around the world discuss how ageism affects them.	Video created by Helpage https://www.youtube.com/watch?v=sv41CdxImiU
Millennials Show Us What 'Old' Looks Like – Disrupt Aging	4.08 minutes	Millennials were asked at what age they consider someone to be old. Next, they were asked to demonstrate how an old person would cross the street, send a text message, do a push-up, and do jumping jacks. Older adults then stepped in and both the millennials and the older adults were instructed to teach each other something they are good at. This activity changed the attitudes the millennials had towards older adults.	Video created by AARP https://www.youtube.com/watch?v=lYdNjrUs4NM
Ageism During COVID-19	0.59 minutes	This video demonstrates the discrimination towards older adults during the COVID-19 pandemic.	Video created by Helpage https://www.youtube.com/watch?v=BdMJRZAvlK8&feature=emb_logo
Total duration of the videos	21.15 minutes		

Table 4: Details of the Videos Used for the Educational Intervention for the Control (CON) Group

Video Title	Duration	Content Covered	Web link
Myth-busting video	4.03 minutes	Dialogue between two individuals based on the common myths about diversity and cultural competency. Eight myths were discussed. Based on content retrieved from: https://ncd.gov/publications/2006/june2006	Video created by the researchers
Cultural competence lecture	5.18 minutes	Defined cultural competence. Discussed different cultures in the U.S. and that the diversity in the U.S. is increasing. Defined different biases and problems of having biases in healthcare/nutrition. Discussed the importance of diversity in sports nutrition.	Video created by the researchers
Building connections with clients through culture and diversity	3.14 minutes	A registered dietitian discusses how culture and entrepreneurship drive him to build business.	Video created by EatRightProTV https://www.youtube.com/watch?v=tqHkj0Dhgb4&t=1s
Combining science, culture, and artistry of food	2.31 minutes	An RDN discusses personal and professional experiences in nutrition and dietetics field.	Video created by EatRightProTV https://www.youtube.com/watch?v=839qkTDVS24
What is culturally competent healthcare?	2.09 minutes	Assistant professor discusses the positive outcomes of cultural awareness in healthcare.	Video created by Towson University https://www.youtube.com/watch?v=E4k8YWqkjqo
Sports dietitian fuels elite student athletes	3.35 minutes	Assistant director of performance nutrition fuels student athletes to perform their best.	Video created by EatRightProTV https://www.youtube.com/watch?v=g603tutiZ_M&t=11s
Total duration of the videos.	20.10 minute		

Data Collection

There were three surveys distributed during the study using Qualtrics at three time points: pre-, immediate post-, and 2-week post-intervention. Throughout the study, email reminders were sent every two days for one week to participants that did not complete the surveys. All data were de-identified after data cleaning.

The pre-survey included questions regarding sociodemographic data such as age, sex, ethnicity, undergraduate major/majors, citizenship status, and past experience with older adults. To assess past experience with older adults, participants were asked to report "yes" or "no" if they have lived/are living with older relatives or have looked/are looking after an older relative. Participants were then asked to report the duration they have lived/are living with older relatives or have looked/are looking after an older relative. Participants were also asked to report "yes" or "no" if they have ever had any working or volunteering experience with older adults and if so to report the duration.

All the Qualtrics-based surveys contained previously validated questionnaires to assess explicit ageism. These include the 13-item Ambivalent Ageism Scale (AAS) [49] and Fraboni Scale of Ageism (FSA) [122]. These are provided in the Appendix 1 and 2. Furthermore, we provided the link to guide the students to complete the implicit ageism test using the Inquisit platform (Millisecond, Seattle, WA) at the end of all Qualtrics surveys.

To assess the participant's perceived "old age" cut-off, we asked "At what age is someone considered to be "old"?" in all three surveys.

The answers for the 29-item FSA questionnaire are based on a 4-point Likert scale ranging from 1= "strongly disagree" to 4= "strongly agree". This was used to indicate how strongly the participants disagreed or agreed with the statement presented in each question [122].

Some of the questions were negatively scored. Scores for the Fraboni Scale of Ageism range from 29 to 116. A higher score implies higher ageism [66]. The Fraboni Scale of Ageism measures antagonism, avoidance, and discrimination toward older adults [122].

In the AAS questionnaire, the answers for the survey questions were based on a 7-point Likert scale ranging from 1= "strongly disagree" to 7= "strongly agree" to gauge the attitudes toward older adults [49]. The AAS also contained two subscales. These are based on the 9 questions that assess benevolent ageism (AAS-benevolent) and 4 questions for hostile ageism (AAS-hostile). Scores for the AAS range from 13-91. A higher total score for the AAS (total-AAS) indicated higher ageism. Scores for the benevolent subscale range from 9-63, and scores for the hostile subscale range from 4-28. A higher score on the AAS-hostile subscale indicates lower competence and warmth ratings. A higher score on the AAS-benevolent subscale indicates higher competence and warmth ratings [49]. The test-retest reliability for the AAS is high (r = 0.80 and Cronbach's alpha of .91).

At the end of all Qualtrics-based online surveys, study participants were directed to complete the Age Implicit Association Test (AgeIAT) administered through the Inquisit platform (Millisecond, Seattle, WA). The age IAT uses 12 photos, an equal number of faces of young and older adults. During this test, the study participants were asked to match eight positive and eight negative words with the faces of young and older adults [123]. The AgeIAT assesses participant's attitudes toward age by asking participants to quickly assign pleasant or unpleasant words to match with young or old faces. To measure the association between the 'hypothesis consistent' pairings, Inquisit calculates D-scores (AgeIAT-D-score). A positive D-score indicates a stronger association between 'Young-Good' and 'Old-Bad' (higher score indicates a higher preference for younger adults compared to older adults) and a negative D-score indicates a

stronger association between ‘Old-Good’ and ‘Young-Bad’ [124]

Statistical Analysis

Mean and standard deviation (SD) are presented for continuous data. The Shapiro-Wilk test was used to assess the normality of continuous data. Mann-Whitney U test was used to compare the age differences between the two groups. Differences in categorical variables between the two groups at pre-intervention were assessed using the Chi-Square test.

Researchers tested the internal consistency of the FSA and total AAS, including the AAS-hostile and AAS-benevolent subscales separately and Cronbach alpha values are reported. Significant outliers that were more than 1.5 times the interquartile range below or above the 25th and 75th percentile were identified for the dependent variables that were being tested as outcomes of the intervention (perceived “old-age” cut off, FSA, total AAS, AAS-benevolent, and AAS-hostile subscale scores and AgeIAT-D-score). Those significant outliers were considered as missing at random and that participant was still included in the analysis.

Spearman correlation analysis was performed for the perceived “old-age” cutoff and ageism scores pre-intervention to assess associations. Mixed model repeated measures analysis was performed to examine the group differences for ageism scores following the educational intervention over the three points of data collection (group-by-time interaction). The best-fitting model was selected based on the presence of the lowest values for the Akaike information criterion (AIC) and Bayesian information criterion (BIC) after running several models with different covariates. In instances where both AIC and BIC were not the lowest, the model with unstructured variance was selected. After performing the group-by-time analysis, the simple effect analysis was performed for each group to see within-group changes over time with multiple comparisons and were adjusted using Sidak’s. SPSS version 27 was used for statistical

analysis.

Qualitative Data Analysis

We followed a strategy described by Puhl, Moss-Racusin [125] for the qualitative data analysis for the answers provided for the written assignment. Answer submissions were analyzed separately per group. Initially, two researchers independently read the answers and made the categories. Next, the two researchers discussed and finalized the categories and subcategories. Again, all the answers were put into subcategories by the two researchers, working independently and compared their analysis afterwards. Finally, the two researchers discussed their analysis and arrived at an agreement for most of the statements. All agreements and disagreements following the discussion were summed separately. To calculate reliability, researchers divided the number of agreements per subcategory by the total sum of disagreements and agreements per category and multiplied that by 100 [126].

CHAPTER IV

RESULTS

Baseline Characteristics

The total number of 59 participants who completed the pre-survey were included in the final analysis. Participants were mostly female (n=55), white-non-Hispanic (n=37), majoring in allied health studies (n=15), and in their second year of school (n=25). All participants were citizens of the U.S. Participants' age ranged from 18 to 41 years of age. Even though the age was significantly different between the INT and CON groups, the mean difference was only about 2 years. Details of the study participants at baseline are described in Table 5.

In the INT group, 56.7% of participants and 31% of participants in the CON group reported that they have lived/are living with older relatives or have looked/are looking after an older relative. Furthermore, 70.5% of participants in the INT group and 44.4% of participants in the CON group reported that experience was more than 6 months. About 17% of participants and 9% of participants in the INT and CON groups, respectively reported that they had some working or volunteer experience with older adults. When asked how long they worked or volunteered with older adults. About 25% of participants in the INT group and 10% of participants in the CON group reported volunteer or working experience with older adults for more than 6 months. We combined the results from these two questions, "Have you ever lived/ you are living with older relatives or you have looked/ looking after an older relative?" and

"Have you ever had any working or volunteer experience working with older adults?" into one variable to assess "past experience with older adults" (Table 5). There was no significant difference between the INT and CON groups regarding past experience with older adults ($p>0.05$).

Table 5. Participant Characteristics

		Intervention group (n=29)	**Control group (n= 30)**	**P value**
Mean age (years)		21.87 (5.37)	19.79 (0.86)	0.01[a] *
Sex	Female	27 (90%)	28 (96.6%)	
	Male	3 (10%)	1 (3.4%)	
Ethnicity	White, non-Hispanic	18 (60%)	19 (65.5%)	
	Black, non-Hispanic	6 (20%)	8 (27.6%)	
	Hispanic or Latin	2 (6.7%)	1 (3.4%)	
	Other	4 (13.3%)	1 (3.4%)	
Major	Nutrition and Dietetics	1 (3.3%)	7 (24.1%)	
	Nursing	4 (13.3%)	7 (24.1%)	
	Exercise Science	2 (6.7%)	4 (13.8%)	
	Allied Health Studies	6 (19.9%)	9 (30.8%)	
	Other	17 (56.7%)	2 (7.2%)	
Year in School	Second year	7 (23.3%)	18 (62.1%)	
	Third year	12 (40%)	7 (24.1%)	
	Fourth year	10 (33.3%)	4 (13.8%)	
	Fifth year	1 (3.3%)	0	
Past experience with older adults	Has experience with older adults	24 (80%)	21 (72.4%)	0.49 [b]
	No experience with older adults	6 (20%)	8 (27.6%)	

Mean and standard deviation (SD) values are shown. For categorical variables, the frequency and percentages (%) are shown for continuous variables.
[a] Mann-Whitney test p-value.
[b] Chi-Square test p-value
*P < 0.05 is considered statistically significant.

Reliability of Ageism Surveys

Reliability of the ageism surveys were tested for each data collection time point. For the FSA questionnaire, Cronbach alpha values were 0.84, 0.90, and 0.90 at the pre-intervention, immediate post-intervention, and 2-week post-intervention, respectively. Cronbach alpha values for the AAS at pre-intervention, immediate post-intervention, and 2-week post-intervention were 0.80, 0.79, and 0.80, respectively. For the AAS-benevolent subscale scores, Cronbach alpha values at pre-intervention, immediate post-intervention, and 2-week post-intervention were 0.76, 0.75, and 0.77, respectively. Finally, Cronbach alpha values for the AAS-hostile subscale scores for pre-intervention, immediate post-intervention, and 2-week post-intervention were 0.73, 0.58, and 0.74, respectively.

Correlations Between the Different Ageism Variables

Since age was not normally distributed (Shapiro Wilk test, p value <0.05). Spearman correlation analysis was performed for pre-intervention time point (Table 6). There was no significant correlation between the age of the participants and perceived "old age" cut-off, or any of the Ageism scores (p value > 0.05).

As expected, both AAS-benevolent and AAS-hostile subscale scores significantly correlated with the total AAS score ($r=0.93$ and $r=0.69$, respectively. p value < 0.001). Furthermore, a significant correlation was observed between the AAS-benevolent and AAS-hostile subscale scores ($r=0.40$; p value < 0.05). A significant correlation was found between the FSA score and the AAS-hostile subscale score ($r=0.34$; p value <0.05).

Table 6. Correlations Between Different Ageism Parameters Pre-intervention

		Age	"Old age" cut off	FSA	Total_AAS	AAS_Ben	AAS_Host	Age IAT _D_score
Age	Correlation Coefficient	--						
	Sig. (2-tailed)	.						
	N	59						
"Old age" cut-off	Correlation Coefficient	0.16	--					
	Sig. (2-tailed)	0.23	.					
	N	57	57					
FSA	Correlation Coefficient	-0.04	-0.14	--				
	Sig. (2-tailed)	0.75	0.31	.				
	N	59	57	59				
Total_AAS	Correlation Coefficient	0.07	0.11	0.22	--			
	Sig. (2-tailed)	0.58	0.41	0.09	.			
	N	59	57	59	59			
AAS_Benevolent	Correlation Coefficient	0.05	0.10	0.07	0.93**	--		
	Sig. (2-tailed)	0.70	0.45	0.61	<0.001	.		
	N	58	56	58	58	58		
AAS_Hostile	Correlation Coefficient	0.13	0.05	0.34**	0.69**	0.40**	--	
	Sig. (2-tailed)	0.34	0.70	0.01	<0.001	0.002	.	
	N	59	57	59	59	58	59	
AgeIAT_D_score	Correlation Coefficient	-0.07	0.16	-0.001	0.15	0.09	0.03	--
	Sig. (2-tailed)	0.65	0.26	0.99	0.28	0.54	0.82	.
	N	51	50	51	51	50	51	51

** Spearman correlation was performed and indicates those significant at the 0.01 level (2-tailed).
Abbreviations: Perceived "old age" cut-off ("old age" cut-off); Fraboni Agesm Scale score (FSA); Ambivalent Ageism Scale score (Total_AAS); Benevolent Ambivalent Ageism subscale score (AAS_Benevolent); AAS_hostile Ambivalent Ageism subscale score (AAS_Hostile); Age Implicit Association Test D-score (AgeIAT_D_Score); number of participants (N)

Changes in Ageism Over Time

When comparing the INT and CON groups across the three time points (group by time interaction) using the mixed model with repeated measures analysis, we did not observe any significant differences for perceived "old-age" cut off or any of the ageism scores ($p>0.05$) (Table 7, Figure 2, 3, and 4). However, in the simple effect analysis for within-group analysis over time, we observed significant changes over time for some of the dependent variables, only in the intervention group ($p<0.05$).

At pre-intervention, the mean perceived "old age" cut-off in the INT group was 60 years while it was about 59 years in the CON group. However, immediately after the educational intervention, the mean perceived "old age" cut-off significantly increased to about 71 years and continued to be at around 72 years even 2 weeks after the educational intervention in the INT group ($p < 0.05$). In contrast, perceived "old-age" cut-off did not significantly change in the CON group ($p>0.05$) (Table 7 and Figure 2).

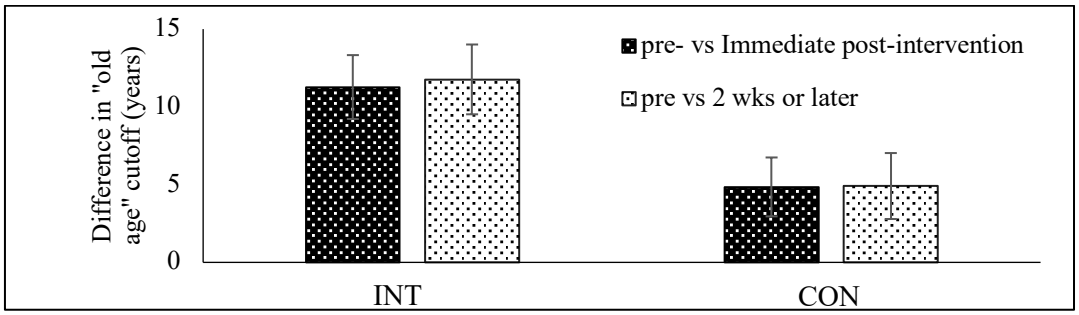
Table 7. Time Trend Analysis for Explicit and Implicit Ageism Variables in the Intervention and Control Groups

Ageism scores	Groups	Pre-intervention	Immediate post	2-weeks post	P for linear trends for time[$]	P for interaction effect for group and time[#]
"Old age" cut-off[a]	INT	60.00 (2.00) [a]	71.27 (1.84) [b]	71.77 (2.23) [b]	<0.001	0.10
	CON	58.68 (2.29)	63.53 (1.96)	63.59 (1.69)	0.06	
FSA [a]	INT	55.47 (1.42) [a]	49.94 (1.96) [b]	49.15 (1.84) [b]	0.01	0.12
	CON	54.83 (1.59)	54.18 (1.93)	54.44 (2.09)	0.92	
Total AAS [a]	INT	40.87 (1.56) [a]	35.66 (1.76) [b]	36.23 (1.82) [b]	0.01	0.08
	CON	41.93 (1.92)	41.54 (1.97)	40.14 (1.98)	0.35	
AAS_Ben[a]	INT	28.45 (1.19)	26.10 (1.33)	26.81 (1.35)	0.20	0.31
	CON	30.55 (1.47)	30.46 (1.50)	29.58 (1.51)	0.44	
AAS_Hostile[a]	INT	12.03 (0.63) [a]	9.63 (0.70) [b]	9.12 (0.71) [b]	<0.001	0.08
	CON	11.38 (0.72)	11.08 (0.76)	9.94 (0.78)	0.10	
AgeIAT_D_score [a]	INT	0.65 (0.10)	0.51 (0.07)	0.45 (0.09)	0.09	0.98
	CON	0.52 (0.08)	0.33 (0.06)	0.29 (0.06)	0.06	

[#] The P values for group and time interaction based on mixed model analysis with repeated measures.
[$] The P values are for changes in score over time per group in the simple effect mixed model analysis.
The values shown for each time point are marginal means (standard errors) estimated from mixed model analyses with simple effect analysis for changes over time per group.
Different superscript letters indicate statistical differences between the time points.
Abbreviations: Perceived "old age" cut-off ("old age" cut-off); Fraboni Agesm Scale score (FSA); Total Ambivalent Ageism Scale score (Total AAS); Benevolent Ambivalent Ageism Scale subscale score (AAS_Benevolent); Hostile Ambivalent Ageism Scale subscale score (AAS_Hostile); Age Implicit Association Test D_score (AgeIAT_D_Score)

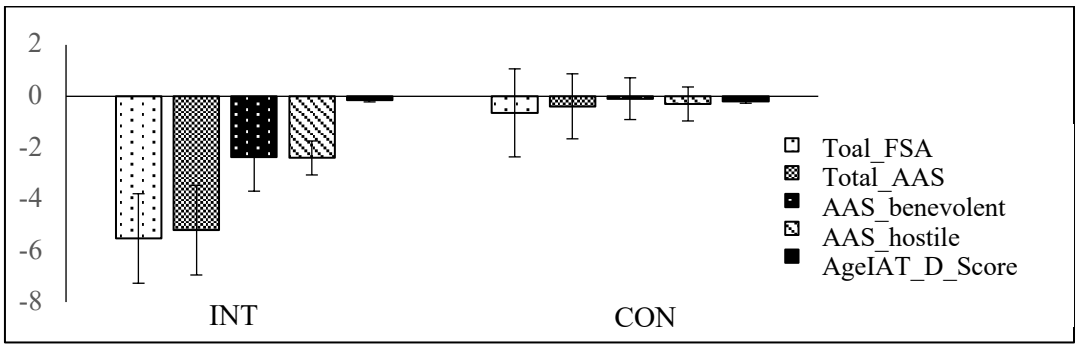
While we did not observe a significant group by time difference for any of the variables for both the INT and CON groups (p value > 0.05), the INT group showed a significant reduction in FSA, total AAS, and AAS-hostile scores from the pre-intervention to the immediate post-intervention and continued to be significantly lower even 2 weeks after the educational intervention (p value <0.05). In contrast, no changes were observed in the CON group in the simple effect analysis (Table 7, Figures 3 and 4).

Figure 2. Group Differences for the Perception of "Old Age" Cut-off Changes Over Time



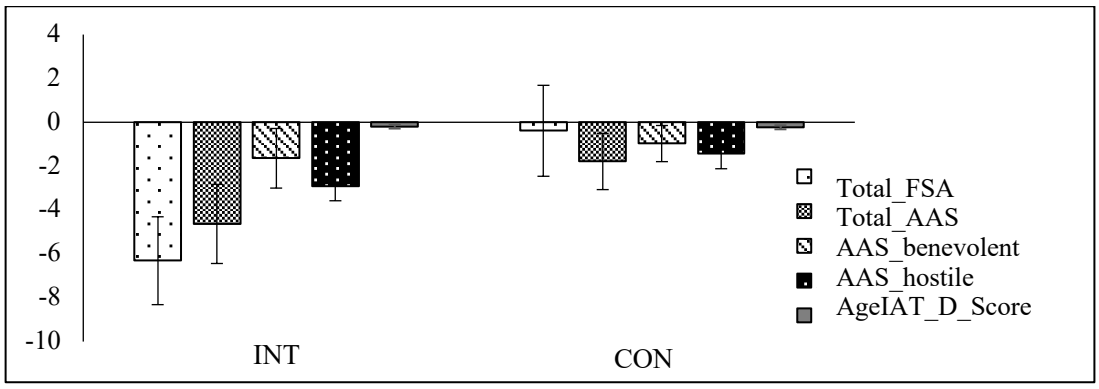
Abbreviation: Intervention group (INT); Control group (CON)

Figure 3. Group Differences in Ageism Variable Scores Pre- vs Immediate Post-intervention



Abbreviations: Fraboni Scale of Ageism score (FSA); Total Ambivalent Ageism Scale score (Total AAS_Score); Benevolent Ambivalent Ageism Scale subscale score (AAS_Benevolent); Hostile Ambivalent Ageism Scale score (AAS_Hostile); Age Implicit Association Test D_score (AgeIAT_D_Score)

Figure 4. Group Difference in Ageism Variable Scores Pre- vs 2-week Post-intervention



Abbreviations: Fraboni Scale of Agesm score (FSA); Total Ambivalent Ageism Scale score (Total AAS_Score); Benevolent Ambivalent Ageism Scale subscale score (AAS_Benevolent); Hostile Ambivalent Ageism Scale subscale score (AAS_Hostile); Age Implicit Association Test D_score (AgeIAT_D_Score)

Perception Regarding the Educational Intervention

Out of 59 participants, only 51 participants completed the educational intervention on Blackboard and answered the open-ended question at the end of the lesson and those were included for the qualitative analysis of those answers. We conducted the qualitative data analysis separately for the INT (Table 8) and CON group (Table A1 in the Appendix). There were no negative remarks regarding the educational material. One participant stated that it was interesting that ageism encompasses younger age cohorts and mentioned that the information regarding ageism toward young adults was not included in the lesson. However, we did not code this statement since it was not aligned with our interests.

Each participant's answer submission was put into at least one subcategory. All participants stated at least one thing that they have learned from the educational intervention. About 54% of participant's in the INT group stated that older adults can do anything that the rest of society can do. Around 46% of participants stated that they recognize society's negative views on aging and older adults and about 23% of participants stated that they believe older adults should be treated equally.

Table 8. Qualitative Data Analysis for the Intervention Group

	n (%)	Reliability
Gathered new Knowledge about older adults and aging		
Older adults can do anything that young adults can do	14 (53.85%)	92.31%
COVID-19 is not just a problem for older adults	2 (7.69%)	100%
Older adults can remain active	4 (15.38%)	100%
Older adults have mental capabilities and can learn new things	7 (26.92%)	100%
I learned new myths about older adults and aging	5 (19.23%)	96.15%
Recognized problems related to aging and ageism in society		
Elder abuse	5 (46.15%)	100%
Older adults at or below the poverty rate	4 (15.38%)	100%
Society's negative view of older adults and aging	12 (46.15%)	96.15%
Knowledge of ageism and problems associated with ageism		
Learned that ageism existed in society	11 (42.31%)	96.15%
Learned about ageism in healthcare	4 (15.38%)	100%
Learned that there is explicit and implicit bias	5 (19.23%)	100%
Learned about the negative effects of ageism	4 (15.38%)	100%
Self-awareness about ageism		
Unaware of biases	3 (11.54%)	96.15%
Perception of "old age" cut-off has changed	8 (30.77%)	96.15%
Induced empathy		
Ageism is sad	7 (26.92%)	96.15%
Call to action and plans for the future		
I plan to be more aware of and reduce my biases	3 (11.54%)	100%
I plan to be more accepting and respectful of older adults	1 (3.85%)	100%
Older adults need more support	4 (15.38%)	100%
Older adults should be treated equally	6 (23.08%)	100%
Older adults need better healthcare	3 (11.54%)	100%

Note: Categories in bold indicate main categories

CHAPTER V

DISCUSSION

The prevalence of ageism in the society and healthcare system can lead to negative health outcomes for older adults [3, 6, 21, 44-48]. Unfortunately, pre-health care professionals including nutrition and dietetic students, are not knowledgeable about aging and older adults in addition to not being interested in specializing in gerontology or working with older adults [4, 76, 106, 108, 109, 127]. Although nutrition is a critical part of preventing and treating chronic diseases common among older adults, nutrition students continue to have the same attitude and dislike for working with older adults. This problem needs to be examined in depth [108]. Dietitians are a part of the healthcare team and it is important that they are educated about older adults' healthcare practices and that they have less ageism [4]. Therefore, we conducted a randomized study with an intervention group who learned about myths regarding aging and ageism while the control group learned about cultural diversity.

We aimed to study the group differences in ageism parameters including perceived “old age” cut off, explicit ageism (using Fraboni Scale of Ageism and Ambivalent Ageism Scale scores), and implicit ageism over time due to the online educational intervention as the primary objective. Even though we hypothesized that there would be a significant group-by-time interaction for perceived “old age”, explicit ageism, and implicit ageism, we did not observe significant findings. However, we did observe significant changes in some of the ageism

parameters over time only in the intervention group.

Several past studies have also used educational interventions to reduce ageism among (participants) individuals in a community, pharmacy students, and undergraduate students [25, 27, 113, 115, 120]. Similar to our study, Lytle and Levy [115] included an educational intervention about ageism in their study and determined the efficacy of the online educational intervention to reduce ageism among undergraduate students. They also randomized the participants, and the surveys were administered online. However, they randomized their participants into 4 groups, of which 3 were experimental groups and 1 was a control group. The experimental groups were education condition, extended condition, and combined condition. In their study design, Lytle and Levy [115] included 3 time points in which they measured for ageism using the 22-item FSA while we used the 29-item FSA. Time 2 included the 10 true/false questions from the Facts on Aging Quiz. Based on the data collected at both the immediate and delayed post-test, Lytle and Levy [115] found that participants in all 3 experimental conditions reported significantly less negative attitudes toward older adults and greater aging knowledge of older adults. Lytle and Levy [115] concluded that brief online strategies aimed at reducing ageism can be effective at reducing ageism. However, they did not study retention of the effect like our study. Although Ermer, York [27] did not randomize their participants, did not study have a follow up data collection like ours, and their intervention did not include education about aging, ageism, and older adults, Ermer, York [27] included two groups, provided a pre- and post-survey, and conducted an intervention that was different for the intervention group. The participants included in the study were aged 20-89 years and consisted of members of the community and university students, which was different from our study. The intervention consisted of 2 intergenerational performances and a discussion following one of the

performances, which was attended by the intervention group. Ermer, York [27] found that for participants under 50 years of age, perception of ageism as a problem in the U.S. increased regardless of program type but did not change significantly for those over 50 years of age. For participants under 50 years of age the belief that their perceptions on ageism could change to a greater extent increased. These changes did not occur significantly for participants over 50 years of age. Ermer, York [27] found that positive views on aging increased and negative stereotypes decreased, measured by changing perceptions about ageism and the Image of Aging Scale, after participants experienced the intergenerational performing arts intervention, regardless of participant age and program type experienced. Similar to our study, [114] conducted a dissertation study to determine whether knowledge about older adults can increase undergraduate student's interest in working with older adults. The Facts on Aging Quiz and the Ambivalent Ageism Scale were used to measure knowledge and ageism. The Facts on Aging Quiz Revised and the "Myths and Realities of Aging" were used for the educational intervention. Following the educational intervention, participant's knowledge of older adults and willingness to work with older adults increased, while ageist attitudes decreased. Different from our study, [114] did not have two randomized groups but only one intervention group.

Lytle, Nowacek [120] included a 2-part intervention in their study called Instapals. Similar to our study, their participants were undergraduate students, they used the FSA to measure stereotypes and attitudes toward older adults, they included education about aging in their intervention, they included an online pre- and post- survey to measure attitudes and stereotypes toward older adults and had a small study sample. Different from our study, Lytle, Nowacek [120] included intergenerational contact as part 2 of their intervention, their study only included one study group, they only measured attitudes and stereotypes about older adults and

aging twice, and there was an 11-week gap between surveys. A significant increase in positive attitudes about aging and older adults, measured by the FSA, among undergraduate students was observed (Lytle, Nowacek [120]. Similar to our study, Lee, Hoerr [110] included college students in an upper-level community nutrition course, participants were randomized to an intervention and control group, a pre-and post-test were included, and an intervention that was different for the intervention and control groups was included in their study. Different from our study, Lee, Hoerr [110] included an intervention where participants were instructed to conduct 3 client interviews and were assigned to work with either an older adult or younger adult. They found that attitudes toward older adults improved after the guided experimental assignment for participants in the intervention group.

The age of 65 years being considered as the age at which someone is considered to be "old" has been described as a myth related to aging by Palmore's Facts on Aging Quiz (FAQ) [121]. To assess this, we asked at what age they believed someone to be "old" in our study and we hypothesized that the perceived "old age" cut-off would significantly increase in the intervention group compared to the control group over time in our study. However, the group-by-time interaction was not significant. Nevertheless, when studying the changes over time per group, the perceived "old age" cut-off increased significantly from a mean age of 60 years to 71 years immediately after the educational intervention and remained significantly higher even up to 2 weeks in the INT group, while the perceived "old age" cut-off for the CON group did not change significantly. This finding could be due to a reduction in myths regarding aging in the INT group from the educational study intervention since one part of the educational intervention for the INT group was based on the Palmore's Facts on Aging Quiz [121] to debunk myths about aging and older adults. However, we are not able to comment whether all the myths regarding

aging changed since we did not measure that in our study. According to our knowledge, we did not find similar past studies exploring the changes in the perceived "old age" cut-off following an educational intervention aimed at reducing ageism. Although they used Palmore's Facts on Aging Quiz in their pre- and post-surveys and not in their educational intervention, Lee, Hoerr [110] observed that for the intervention group, student's knowledge of aging and older adults increased after the intervention.

Although we did not observe a significant group by time difference for FSA, we observed that the scores decreased significantly after the educational intervention and remained significantly lower even up to 2 weeks only in the intervention group. Several past studies have also used the FSA to measure ageism among participants [66, 115]. Lytle and Levy [115] observed that among the experimental condition participants, FSA scores decreased from Time 1 to Time 2 and increased slightly from Time 2 to Time 3. Compared to control condition participants, experimental condition participants showed significantly fewer negative attitudes toward older adults [115].

The AAS questionnaire, which includes the benevolent and hostile subscales, was used in our study to measure both benevolent and hostile ageism among participants. We did not find a significant group by time interaction for the total scores of the AAS. However, total AAS scores for the INT group decreased significantly after the educational intervention and remained significantly lower even up till 2 weeks later. Similar findings were observed only for the AAS hostile subscale as well. In contrast, the scores for the CON group did not change significantly. Previous studies have also found the AAS and its subscales useful for measuring benevolent and hostile ageism among participants [49]. However, to our knowledge, there are no previous intervention studies similar to ours that used the AAS.

We did not observe a significant group by time difference for the Age IAT similar to other scores. Furthermore, we did not observe any difference even in the intervention group with simple effect analysis. In contrast to our study, Lueke and Gibson [123] found an immediate reduction in implicit age bias in the intervention group who listened to the mindfulness audio. Similar to our study, Lueke and Gibson [123] included college students who were assigned to 2 groups. The intervention was different for the experiment and control groups and used the Age IAT to measure implicit bias before and immediately after the intervention. However, their study was not a randomized study and did not have a long-term follow up.

Even though the median age was significantly different between the two groups, we did not observe any significant correlations between the age of the participants with the other outcome variables. This could be because ageism is present even in older adults. Ermer, York [27] found that after their intervention, participants under 50 years of age reported a significant increase in perception of ageism. Hummert, Garstka [128] conducted their study among participants in 3 different age groups (young, median, and old) and used the age IAT to measure implicit bias. They found more bias against older adults among the old-old participants.

We observed significant correlations between total AAS score and it's two subscale scores (benevolent and hostile). Also, benevolent and hostile subscale scores were positively correlated. Although they are different types of ageism, they may go hand-in-hand. Interestingly, we found a significant positive correlation between the scores of FSA score and the AAS-hostile subscale score. This could be because the FSA is mainly assessing hostile ageism. This demonstrates the usefulness of the AAS because it can measure different types of ageism.

The present study had many strengths. Similar to past studies, our study was a randomized study with an intervention and control group. We collected data before and after the

educational study intervention allowing us to study change over time and assessed at 2 weeks later allowed us to study retention of the material learned. Our online education intervention contained several videos aimed at increasing knowledge (about ageism, problems of ageism, and about myths of aging) as well as inducing empathy. Furthermore, the INT and CON groups had almost the same duration for the online educational material. We used standardized questionnaires for ageism, and we used the electronic version of the IAT for age. Also, the study participants were blinded regarding the aim of the study until the study was completed to prevent any biases. Finally, since this is an online intervention, it has practical value.

Despite the strengths mentioned above, our study has a few limitations. Our sample size was small, and the majority were females. Even though we attempted to recruit a large sample, there was limited participation and some dropouts. Small sample size could be one of the reasons for not observing significant group-by-time interactions for the study outcomes. We had to limit the follow up only to 2 weeks due to time constraints during the semester and we wanted to complete before the classes were taught about nutrition in older adults which is in their syllabus. However, the two week follow-up still provide some insight regarding retention. Even though the data collection was intended to occur immediately and 2 weeks after the educational intervention, few participants had longer time gaps which may affect the study findings. Our educational intervention contained only videos administered via Blackboard and we did not include any component allowing interactions with older adults. Boswell [68] suggested that quality of contact is more influential than quantity. From their systemic review and meta-analysis on interventions to reduce ageism against older adults, Burnes, Sheppard [25] found that combining education about aging and older adults and intergenerational contact had the most significant effect on ageist attitudes among participants. We did not have a control group that did

not participate in any educational study intervention. Lastly, we cannot generalize this study finding because we only used undergraduate students enrolled in an entry-level nutrition class.

CHAPTER VI

CONCLUSION

In conclusion, this randomized study with INT and CON groups exploring the effectiveness of an educational intervention to reduce ageism suggests the importance of teaching about ageism to undergraduate students entering healthcare fields, especially nutrition and dietetics. The educational study intervention for the intervention group included videos on ageism, debunking myths about older adults and aging, and other videos stereotyping older adults and aging, and its negative effects. Even though group-by-time interactions were not significant, perceived "old age" cut-off, Fraboni Scale of Ageism scores, Total Ambivalent Ageism Scale scores, and the scores for the hostile subscale of the Ambivalent Ageism Scale significantly changed only in the INT group. Future large-scale studies are needed to validate our findings. Learning about ageism and debunking myths about aging can be useful to reduce ageism among undergraduate students entering healthcare fields, especially nutrition and dietetics. Thus, incorporating educational material on aging, older adults, and ageism into course material for nutrition and dietetic students, can be beneficial to reduce ageist attitudes toward older adults.

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LIST OF APPENDICES

Appendix 1: Fraboni Scale of Ageism

Cited from Rupp, D.E., S.J. Vodanovich, and M. Credé, *The multidimensional nature of ageism: Construct validity and group differences.* The Journal of social psychology, 2005. **145**(3): p. 335-362.

1. Teenage suicide is more tragic than suicide among the old.
2. Many old people are stingy and hoard their money and possessions.
3. Many old people are not interested in making new friends, preferring instead the circle of friends they have had for years.
4. Many old people just live in the past.
5. I would prefer not to go to an open house at a senior's club, if invited.
6. Most old people should not be trusted to take care of infants.
7. Many old people are happiest when they are with people their own age.
8. Most old people would be considered to have poor personal hygiene.
9. Most old people can be irritating because they tell the same stories over and over again.
10. Old people complain more than other people do.
11. I sometimes avoid eye contact with old people when I see them.
12. I don't like it when old people try to make conversation with me.
13. Complex and interesting conversation cannot be expected from most old people.
14. Feeling depressed when around old people is probably a common feeling.
15. Old people should find friends their own age.
16. Old people should feel welcome at the social gatherings of young people.
17. Old people don't really need to use our community sports facilities.
18. It is best that old people live where they won't bother anyone.

19. I personally would not want to spend much time with an old person.
20. The company of most old people is quite enjoyable.
21. It is sad to hear about the plight of the old in our society these days.
22. Old people should be encouraged to speak out politically.
23. Most old people are interesting, individualistic people.
24. There should be special clubs set aside within sports facilities so that old people can compete at their own level.
25. Old people deserve the same rights and freedoms as do other members of our society.
26. Most old people should not be allowed to renew their drivers licenses.
27. Old people can be very creative.
28. I would prefer not to live with an old person.
29. Old people do not need much money to meet their needs.

* The answers for the survey questions are based on a 4-point Likert scale ranging from 1= "strongly disagree" to 4= "strongly agree".

Appendix 2: Ambivalent Ageism Scale

Cited from, Cary, L.A., A.L. Chasteen, and J. Remedios, *The ambivalent ageism scale: Developing and validating a scale to measure benevolent and hostile ageism.* The Gerontologist, 2017. **57**(2): p. e27-e36.

1. It is good to tell old people that they are too old to do certain things; otherwise, they might get their feelings hurt when they eventually fail.
2. Even if they want to, old people shouldn't be allowed to work because they have already paid their debt to society.
3. Even if they want to, old people shouldn't be allowed to work because they are fragile and may get sick.
4. It is good to speak slowly to old people because it may take them a while to understand things that are said to them.
5. People should shield older adults from sad news because they are easily moved to tears.
6. Older people need to be protected from the harsh realities of society.
7. It is helpful to repeat things to old people because they rarely understand the first time.
8. Even though they do not ask for help, older people should always be offered help.
9. Even if they do not ask for help, old people should be helped with their groceries.
10. Most old people interpret innocent remarks or acts as being ageist.
11. Old people are too easily offended.
12. Old people exaggerate the problems they have at work.
13. Old people are a drain on the health care system and the economy.

* The answers for the survey questions were based on a 7-point Likert scale ranging from 1= "strongly disagree" to 7= "strongly agree".

Appendix 3: Qualitative Data Analysis for the Control Group

	Frequency n (%)	Reliability
Knowledge of cultural competency	23 (92%)	
I learned what cultural competence means	6 (24%)	72%
I learned myths about cultural competency	6 (24%)	100%
I learned or acknowledge that America is diverse	11 (44%)	96%
Importance of cultural competency	47 (188%)	
Nutrition, diet, and food and cultural competency	15 (60%)	84%
Cultural competency in society	12 (48%)	72%
Cultural competency in healthcare and biases in healthcare	20 (80%)	76%

VITA

Ann Irvin Armstrong

Education

2019 - 2021 Master of Science in Nutrition and Dietetics,
University of Mississippi, Oxford, MS

2015-2019 Bachelor of Science in Nutrition and Dietetics,
University of Mississippi, Oxford, MS

Employment

August 2019 – Present Graduate Assistant at The Institute of Child Nutrition, University of Mississippi

- Create and edit Manager's Corner.
- Grade and record pre/post- assessments
- Record training evaluations
- Customer service/receptionist
- Assist on projects assigned to me
- Note-taking during important conferences

June 2018 – July 2019 Student Worker at The Institute of Child Nutrition, University of Mississippi

December 2015 - Present Child-Care, Private Residence Babysitter:

- Supervised and cared for children in the absence of parents or regular caregiver.

December 2015-2018 The Everyday Gourmet, Jackson, MS

- Wrapped gifts and made gift baskets for customers.
- Inventory
- Customer service

Shadowing Experience

December 2015 Stephanie Hollingsworth, RD, CDE
Children's of Mississippi, Batson Specialty Clinic
Pediatric Nutrition

December 2015 Krista King, RD
Children's of Mississippi, Batson Specialty Clinic
Pediatric Nutrition

Research Experience

August 2020 - Present Masters thesis research in the University of Mississippi, Department of Nutrition and Hospitality
Title "Educational intervention to reduce ageism in undergraduate students in an entry-level nutrition course".
Thesis Committee members:
Nadeeja Wijayatunga, MD(MBBS), MPhil, PhD (Chair)
Kathy B. Knight, PhD, RD
Teresa Carithers, PhD, RD, LD, FAND
Anne K. Bomba, PhD

Research Skills

- Preparation and administering surveys using Qualtrics
- Study participant recruitment, screening, and follow-through
- Data collection and data management
- Analyzing qualitative data
- Proficient in Microsoft Excel, Word, PowerPoint and Endnote
- Using Implicit Association Test using Inquisit (Millisecond, Seattle, WA)

Awards

January 2021 1st place in 3MT (Three-Minute Thesis) Competition in the Masters student category, conducted by the Graduate School of the University of Mississippi.

Guest Speaker

Spring 2021 For GER 499 (In the Applied Gerontology program) – Short talk on Ageism based on the 3MT presentation

Professional Membership

February 2016 - 2017 Student Member of Academy of Nutrition and Dietetics

February 2021 – Present Student Member of Academy of Nutrition and Dietetics

Extracurricular Activities

September 2015 –
May 2019 Member of Alpha Delta Pi Sorority (currently, alumni)

- Participated in a fundraising event (ADPi Burgers and Fries) for the Ronald McDonald House of Charities

Community and Volunteer Service

August 2015-August 2018 Participated in Care Walk

January 2018-May 2018 Good Food for Oxford School

- Volunteer work for my community nutrition class