COMMUNITY GARDENING: A NOVEL INTERVENTION FOR
BHUTANESE REFUGEES LIVING IN THE USA

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Since 2008, the United States (USA) has resettled thousands of Bhutanese refugees, providing brief financial support and pathways to citizenship. Despite the efforts of governing bodies and voluntary agencies which facilitate resettlement, many refugees struggle with adapting to the vastly different lifestyle, economy, language and social structures. In particular, effectively addressing psychological needs of this population is a challenge for service providers operating within an expensive health care system based on Western constructs of mental health. In response to this challenge, refugee resettlement agencies throughout the country use community gardens to promote psychological healing, self-sufficiency, community engagement, and a return of human dignity. Though success of these programs is being shared in the media, there has yet to be empirical data examining their impact. The current study tested whether Bhutanese refugee engagement in a community garden impacts symptoms of depression, anxiety, PTSD and somatic complaints. The study also investigated whether community gardening is associated with perceptions of social support and adjustment to life in the United States. Quantitative and qualitative data was collected from 50 adult Bhutanese refugees in Fort Worth, Texas. Gardening was significantly related to increased social support overall, a key factor in overall functionality within communal cultures; and specifically perceived tangible support was increased. A significant effect of gardening was also found for adjustment. Although a significant effect was not found for psychological and somatic symptoms, there is still evidence of effects on somatic complaints. Varying results from quantitative and qualitative data warrant further investigation into the nuanced work of clinical research and advocacy with refugee populations.
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Acknowledgements

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CHAPTER I

OVERVIEW

The impact of war, mass violence and displacement on health and well-being has been extensively documented throughout the decades (Roelfs, Shor, Davidson, & Schwartz, 2010), and researchers, service providers and political bodies are continuously working to provide appropriate care and interventions. Families fleeing conflict, political turmoil, and persecution often experience multiple traumatic and life changing events throughout processes of diaspora and the pursuit of safety (Porter & Haslam, 2005). According to the US Citizenship and Immigration Services, any individual who is outside their country of origin and unable or unwilling to return due to a well-founded fear of persecution based on race, religion, nationality, political opinion, or membership of a particular social group, and who is of particular humanitarian concern to the United States government is considered to be a refugee (Immigration and Nationality Act Sec 101(a)(42). In fiscal year 2012, the United States facilitated the resettlement of 58,238 legally recognized refugees (Office of Refugee Resettlement website, FY 2012 Arrivals).

In 1990, tens of thousands of Bhutanese residents of Nepali heritage were forced to leave the country of Bhutan, in a political effort to homogenize the country's culture (Schäppi, 2005). Prior to the order for these families to leave the country, many lost their jobs, homes, and were detained or tortured with accusations of political conspiracy. Because the Bhutanese government has been unwilling to repatriate Nepali-descent families, and these families were unable to attain citizenship in Nepal or India, tertiary countries such as the United States began opening channels of refuge and integration (Cultural Orientation Resource Center, 2007; Gazmere, Bishow, 2000).
COMMUNITY GARDENING: A NOVEL INTERVENTION

Since 2008, the USA has resettled thousands of Bhutanese refugees, providing brief financial support as well as pathways to citizenship. Despite the efforts of the USA Office of Refugee Resettlement (ORR) and the voluntary agencies (VOLAGs) which facilitate the details of family or individual resettlement, many refugees struggle with adapting to the vastly different lifestyle, economy, language and social structures of the United States (American Psychological Association-APA, 2010). In particular, effectively addressing the psychological needs of this population has been a challenge to service providers operating within a limited and expensive health care system (APA, 2010). In addition, the traditional Western lens for mental health care can result in providers struggling to find ways of overcoming linguistic and cultural nuances (APA, 2010).

The study herein sought to explore the potential use of community gardening as a novel intervention in promoting health and healing in refugees resettled in the United States. Specifically, the study examined the effects of community gardening on the physical and psychological health of Bhutanese refugees at a local garden. Prior to explicating specific hypotheses, a more comprehensive review of the literature will be provided for context.
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CHAPTER II

REVIEW OF THE LITERATURE

Bhutanese Background

One of the smallest countries in the world, the kingdom of Bhutan is landlocked between China and India and is known for its natural beauty and rich traditions. Roughly half the size of the state of Indiana (CIA World Factbook, 2013), the country is comprised of three main ethnic groups: Ngalong, primarily residing in the eastern part of the country; Sharchop, who are largely found in the northern part of the country; and Lhotshampa, originally from Nepal and invited as migrant workers to clear southern landscape between 1875 and 1940 (Dutton, 2011; Schäppi, 2005). Lhotshampa immigrants who worked ten years in Bhutan were granted citizenship in the Nationality Law of 1958 and were provided land tax receipts at the time of registration, though the majority retained their cultural identity and practices (Dutton, 2011; Sokoloff, 2005). Together with various smaller central and western ethnic groups, the Ngalong and Sharchop form the population majority group Drukpa, which shares the common language of Dzongkha and the practice of Tibetan Buddhism (Schäppi, 2005). The Lhotshampa, in contrast, primarily speak Nepali and practice Hinduism, though Lhotshampa Hinduism is similar in many respects to Buddhism practiced in Bhutan (Schäppi, 2005). Although the overarching Drukpa group holds leading political power and claims majority population, there are discrepancies among sources providing information on exact population statistics (Schäppi, 2005; CIA World Factbook; Hunt, 2003). In 1907, the Buddhist theocratic state, loosely composed of practically independently functioning provincial leaderships, became politically unified under a monarchy. Dzongkha was established as the national language in 1961, and Buddhism was officially recognized as the national religion (Schäppi, 2005; Aris, 1994).
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The government promotes a policy of investing in Gross National Happiness, "a process that seeks to maximize happiness rather than economic growth," by capitalizing on individual strengths and incorporating the understanding of material, spiritual and emotional needs into policy (Program Commission, 1999b; Schäppi, 2005). As part of this goal, the government has strongly emphasized the importance of political, religious, linguistic, and cultural homogeneity, promoting "one nation, one people" as a banner line (Program Commission, 1999b, UNHCR 2001; Cultural Orientation Resource Center-CORC, 2007). Due to the increasing size and influence of the Lhotshampa population and culture, a national decree was issued in 1989 enforcing traditional Drukpa dress as the national dress code and removing Nepali language curriculum from schools (Schäppi, 2005; Hunt, 2003; Cultural Orientation Resource Center, 2007). This decree was met with resistance from Nepali-speaking Lhotshampa who saw the mandated cultural homogeneity as a threat to their group identity (Schäppi, 2005). The Citizenship Act of 1985 then decreed families must be able to prove residency prior to December 31, 1958 to be considered citizens; land tax receipts issued in 1958 were acceptable forms of proof (Dutton, 2011). The national census data collected between 1988 and 1990 appeared to categorize many Lhotshampans as non-native, Many Lhotshampans began leaving the country for neighboring Nepal, where some began organizing protests and, at times, even using violence to amplify their protesting voices (Schäppi, 2005; International Organization of Immigration-Nepal, 2008). In the Fall of 1990, demonstrations in southern districts erupted, leading to closure of government-run schools and demarcation of demonstrators as anti-nationalists (Dutton, 2011; Bhutanese Refugee Support Group, 2001)

Over the next few years, thousands of demonstrators and individuals associated with demonstrators were imprisoned and tortured physically and psychologically, many never seeing
a formal trial (Working Group on the Universal Periodic Review, 2009; Bhutanese Refugee Support Group, 2001). The following year, the government began a process of forcing anti-nationalists to sign voluntary migration papers, along with any family members or close associations who could also be conceived of as a potential threat (Dutton, 2011; Bhutanese Refugee Support Group, 2001). The United Nations High Commission for Refugees (UNHCR) estimates 108,000 fled Bhutan for neighboring countries, and are considered by the international community as refugees and stateless persons (UNHCR, 2001, 2006, 2010).

Although Bhutan has made efforts to reopen borders and loosen homogeneity and immigration policies, most of the country's refugees are unable to provide the required paperwork or pay the high fees associated with reinstating citizenship and reentering the country. As a result, this policy change is generally seen as a public relations move rather than a real effort at reconciliation (CORC, 2007; UNHCR, 2006; Dutton, 2011; Human Rights Watch, 2007). For sixteen years, refugees from Bhutan resided in seven (now consolidated to two) UNHCR-established camps throughout eastern Nepal (CORC, 2007; UNHCR 2006). Due to political and economic concerns, only a handful of individuals were able to obtain citizenship in Nepal (CORC, 2007; UNHCR, 2006; Human Rights Watch, 2007). Beginning in 2006, the United States of America lead seven other countries (Australia, Canada, Denmark, the Netherlands, New Zealand, Norway, the United Kingdom) in beginning to open legal immigration pathways to resettlement for Bhutanese refugees (CORC, 2007; UNHCR, 2012; Center for Disease Control - CDC, 2013). Since then, approximately 57,000 Bhutanese refugees have started their lives anew in the USA (CDC, 2013). The Organization of Bhutanese Society; Dallas-Fort Worth estimates there are around 5,000 Bhutanese refugees currently residing in the
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Dallas/Fort Worth area, about 45% of all Bhutanese refugees in the state of Texas (Organization of Bhutanese Society; Dallas-Fort Worth website)

Bhutanese Refugees - A Profile

The large majority of Bhutanese refugees are ethnically Nepali (Lhotshampa) and practicing Hindus (CORC, 2007; Dutton, 20; Hutt, 2003). The Nepali culture and Hindu practices and beliefs guide much of their traditions and worldview orientations. A smaller percentage is Buddhist (27%), with about 1-7% Christian (CORC, 2007). Traditional and localized religious practices are often incorporated into modern approaches to health care and healing (CORC, 2007). Many marriages and social interactions are still influenced by an understanding of the Nepali Hindu Caste System (CORC, 2007; IOM, 2008.) The Hindu religious system informs the individual's relation to self, environment, and society. Values and worldviews within Hinduism place emphasis on the individual as part of a Collective Whole in a societal context and on a spiritual plane. Households typically include parents, grandparents, unmarried children, married sons and their families, and grandchildren. Extended family members such as aunts, uncles and cousins are also typically considered part of the immediate family; in fact, cousins often refer to each other as brothers or sisters (CORC, 2007). Education in Nepali camps is carried out in English and Nepali through grade 10, after which, students are eligible to attend local Nepali schools (CORC, 2007). The majority of Bhutanese refugees identify as famers, though there have been opportunities for teaching, social work, and some vocational training within the Nepali camps (CORC, 2007).

Little formalized education, especially for older generations with primarily agrarian backgrounds, contributes to a challenging transition from life in a refugee camp to life in an industrialized country. English language acquisition is the key to landing a job with a livable
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wage, adjusting to new cultural nuances, and accessing public benefits when needed. (APA, 2010; CORC, 2007; Pumatiega, 2005). Difficulty engaging in the demanding American work culture is often compounded by over a decade of dependence on foreign aid in a refugee camp (HRW, 2007). Among Bhutanese refugees in the USA, there is also a mistrust of the immigration process, having been invited in to a country previously only to be expelled for sociopolitical reasons (Dutton, 2011). Refugees in the USA are eligible to apply for citizenship after five years of residency, but lose access to public benefits if they are not able to pass the English written and oral tests after seven years of residency. The desire for membership and national identity, combined with the potential to lose necessary resources, often becomes a distressing preoccupation for many (Dutton, 2011; HRW, 2007). On top of personal challenges, many refugees often face discrimination in their new communities, and students frequently encounter bullying or isolation in schools (Segal & Mayadas, 2005; APA, 2010).

Post-Resettlement Challenges

When someone arrives in a new country as a refugee, there is usually a period of post migration euphoria in which families are filled with relief from their past and hope for the future. This quickly dissipates, however, once the stressors of unemployment, separation from families, discrimination, and navigation of new laws and social systems become apparent, leading to post migration depression and distress (APA, 2010; Carswell, Blackburn & Barker, 2009; Keyes, 2000; Pumatiega, Rothe & Pumariega, 2005). Most refugees flee home with little to no possessions, and therefore must start from scratch upon arriving in the USA. Government funding is typically provided for up to eight months, though this amount is very limited and only guaranteed for four months. In this time they are expected to become self-sufficient, but many families continue to rely on government support or local charities years after initial arrival.
Large populations of resettling refugees have limited educational backgrounds, or must get previously earned degrees equivocated by US standards. This, in addition to frequent language barriers, makes finding immediately gainful employment often extremely difficult. Many groups have spent upwards of a decade living in UNHCR-sponsored camps, unable to legally work and therefore living on provisions handed to them. Moving to a country which highly values independent work efforts can be an unexpected challenge for families who have been dreaming of easily attaining the affluent American lifestyle depicted in camp rumors and pop culture (Mahler, 1995).

Families must learn how to adjust to shifting roles, brought on by younger family members quickly adapting to a new language and culture while senior family members struggle on at a slower pace. Attachments to crystallized ethnic identity for adult refugees can sometimes butt up against a need for flexibility and adaptation in a new environment (Carswell, Blackburn & Barker, 2009; Pumatiega, Rothe, & Pumariega, 2005). The balancing act of holding on to a valued ethnic identity while adapting to new cultural rules and nuances presents a challenge that effects family units and individuals (Pumatiega, Rothe, & Pumariega, 2005). A shift in family dynamics is frequent among refugees and immigrants, as senior family members fight to retain the values of their upbringing, and children struggle to adapt to social pressures and the excitements of a new culture (APA, 2010; Keyes, 2000; Pumatiega, Rothe, & Pumariega, 2005). Although social support is one key element in post migration adaptability, isolating within same-language communities can also inhibit developing adaptive skills and knowledge (Benson, Sun, Hodge, & Androff, 2011; Keyes, 2000; Pumatiega, Rothe, & Pumariega, 2005). English language learning becomes more difficult and navigation of public benefits or communication with employers and school personnel are more challenging for those who
insulate themselves within their sociolinguistic group (APA, 2010; Keyes, 2000; Pumatiega, Rothe, & Pumariega, 2005).

**Bhutanese Mental Health**

Throughout the odyssey of enduring political conflict, flight to a country of asylum, internment in refugee camps, migration to a third country of asylum, and adjusting to a new culture and lifestyle, there are many opportunities to experience potentially traumatizing events. Stressors frequently encountered by refugee and migrant populations can be categorized as premigration and postmigration stressors (Mollica, Wyshak & Lavelle, 1987). In addition to the loss of material resources, arrests and frequent instances of torture, Lhotshampans were also denied the right to identifying with the country they saw as home (Van Ommeren, et al., 2001).

A study of Bhutanese refugees in Nepal found that individuals who experienced torture were more likely to suffer from somatoform pain disorders, dissociative disorders, PTSD symptoms, and anxiety; and noted the lifetime prevalence of PTSD symptoms at 14.5% for non-tortured Bhutanese refugees (Van Ommeren et al., 2001). A review of other studies conducted in Nepali refugee camps found that both survivors of torture and non-tortured individuals suffered prolonged mental health problems (Mills, Singh, Roach & Chong, 2008). Fazel, Wheeler and Danesh (2005) estimated that overall, refugees are roughly ten times more likely to experience PTSD than age-matched citizens of host countries. The identities of Bhutanese refugees have already been invalidated by the country of Bhutan, and relying on foreign aid for decades creates a sense of hopelessness and helplessness among families (HRW, 2007; IOM, 2008). Schäppi, (2005) proposed that identification with one's social environment, here a culture or nation, is a vital component of psychological stability. Applying for resettlement and the multitude of
subsequent interviews and medical examinations also fosters confusion and uncertainty (HRW, 2007; IOM, 2008).

Once in the US, unemployment strongly contributes to anxiety and depression (Pumatiega, Rothe, & Pumariega, 2005). Struggling with the weight of poverty and dashed expectations of easy new lives also contributes to distress and family strife as parents cope with being unable to provide stability and models of adaptability for onlooking children (APA, 2010; HRW, 2007; Pumatiega, Rothe, & Pumariega, 2005). Older adults are particularly susceptible to anxiety and depression from isolation. As younger family members work and adapt, they struggle with flexibly adopting a new language and culture, as well as shifting identities resulting from altered family roles (Benson, Sun, Hodge, & Androff, 2011; Keyes, 2000; Pumatiega, Rothe, & Pumariega, 2005; APA, 2010). Families also experience unexpected stress from the time limitations on financial aid, case management, and access to public benefits (Simich, Beiser, & Mawani, 2003).

Though the Bhutanese refugee community has shared experiences from political oppression and immigration, a Hindu worldview places emphasis on the present moment and family functionality over that of the individual. (APA, 2010; Dutton, 2011; Pumatiega, Rothe, & Pumariega, 2005). This perspective of the 'bigger picture' being the most important guide for decision-making contributes to what has been called by some psychiatrists an "underdeveloped ego" or a blurring of lines between self and others (Hodge, 2004). PTSD symptoms and anxiety are therefore often endured in silence and seclusion. Following an unusually high number of reported suicides (sixteen) between 2009 and 2012, the Center for Disease Control and Prevention called for an investigation in to suicidality among Bhutanese refugees. Three additional suicides were reported to the Office of Refugee Resettlement soon after the initiation
of the investigation, but were not included in the published stakeholder report (Center for Disease Control and Prevention - CDC, 2012). Report participants called for community resources and education to address mental illness and distress within their communities, as well as further assistance navigating the confusing social and economic systems (CDC, 2012, 2013).

Nepali conceptualizations of psychological distress are intertwined with religious and spiritual values, a communal perspective, and localized traditional beliefs (Benson, Sun, Hodge & Androff, 2011; Kohrt & Hruschka, 2010). Different words and phrases in Nepali are used to convey varying degrees of psychological distress, and some hold more stigma than others (Kohrt & Hruschka, 2010). This is an important consideration for any health professional or community intervention program, and necessitates the inclusion of community leaders and interpreters with a solid understanding of English and Nepali meanings. Bhutanese conceptualization of distress is expressed as tension in the heart-mind (man), sadness, mental burden, thinking too much, and remaining idle (Chase, 2012; Kohrt & Hruschka, 2010). There is stigma in Nepali culture surrounding afflictions of the man, largely due to the karmic belief that such afflictions and traumatic events are results of wrong doings in this life or previous lives (Kohrt & Hruschka, 2010). Symptoms of psychological distress among refugee populations living in the US are frequently expressed as medically unexplained somatic complaints, such as body aches and headaches, and evidence of dissociation, anxiety, depression, psychosis and/or PTSD are also frequently observed (Keyes, 2000). Distress also manifests in abuse of alcohol and domestic violence (APA, 2010; Pumatiega, Rothe, & Pumariega, 2005). Van Ommeren, et al. (2002) found that PTSD symptoms predicted somatic complaints in Nepali refugee camps. Families tend to prefer addressing issues of psychological or social distress on a family or community level before seeking professional Western interventions in the US (Chase, 2012).
enacted support for suffering individuals, when properly utilized, has potential to halt progression of distress into more severe mental illness (Chase, 2012).

Community Intervention

Although there has been increasing attention to addressing the psychological needs of refugees and other survivors of human rights abuses and displacement, the landscape of screeners and interventions is continuously evolving and adapting. Leaders in the field of post-disaster response and mental health care must tediously comb through Western concepts of mental health to find common ground on which to effectively address the mental health needs of these populations (Eth, 1991; Van Ommeren et al., 2000). Refugee services vary by city and state, therefore people receive different levels of screening and services depending on where they are resettled. Although it is clearly evident refugees suffer psychological distress form pre and post migration factors, this distress is often manifest in ways unfamiliar to Western practitioners and service providers. There is, therefore, a need for developing a deeper understanding of unique cultural externalizations of psychiatric distress, as well as appropriate interventions. Among the challenges in providing mental health services to refugee groups in the US are initial identification of needs, access to affordable treatment and resources, bridging linguistic barriers, navigating differing views of mental health and mental illness, negative stigma, and lack of trust (APA, 2010; Chase, 2012; Eth, 1991; Williams & Thompson, 2011). Many mental health care professionals struggle with inclusion of religious and spiritual values in treatment and the family-centered Bhutanese perspectives, which dictates involvement in most aspects of treatment. The Hindu understanding of health as an interaction of mind, body and spirit with emphasis on externalized symptoms can also present a unique challenge in typical psychotherapy settings (Hodge, 2004).
COMMUNITY GARDENING: A NOVEL INTERVENTION

There is a need to address identification of distress and treatment from multiple levels (i.e. individual, family, and community) in order to adapt to varying population needs and local capacities. Reports on best practices in addressing refugee mental health consistently call for multi-level, adaptable community engagement (APA, 2010; Chase, 2012, Kohrt & Hruschka, 2010; Wessells, 2009; Williams & Thompson, 2011). The benefits of communal living and group activities are inherent in Bhutanese village structures, refugee camps, and Hindu philosophies (Chase, 2012; Dutton, 2011). Norris and Alegria (2005) recommend addressing psychosocial needs of post conflict and refugee populations by collaborating with community stakeholders to develop innovative and empowering programming based on community needs and strengths. Mitscke, Aguerre & Sharma, 2013, found that Bhutanese refugee women engaged in financial literacy and knitting groups showed a decrease in symptoms of PTSD, anxiety, depression and somatization. Participants not in these groups actually showed increases on symptoms at a 6 month follow up, despite receiving the standard case management services at a local refugee resettlement agency (Mitscke, Aguerre & Sharma, 2013). Another important consideration is that although PTSD is a convenient framework to conceptualize the suffering of refugee populations, it does not account for the broader context of community psychological and functional disturbance (Ager & Loughry, 2004; Kohrt & Hruschka, 2010).

Community Gardening: A Novel Intervention

Many different programs in resettlement countries have been developed to meet the needs of refugee communities. One intervention that has been gaining particular popularity is the platform of community gardening. Typically found in urban settings, community gardens generally consist of multiple plots of earth cultivated by different families or individuals, and often contain communal plots for high-yield crops to be shared among stakeholders (Okvat &
COMMUNITY GARDENING: A NOVEL INTERVENTION

Zautra, 2011). The Office of Refugee Resettlement (ORR) has recognized the potential benefits of community gardening, and provides funding under the Refugee Agricultural Partnership Program (RAPP) to help organizations start community gardens and is currently supporting 16 gardening projects (see ORR RAPP website). Of particular note, is the International Rescue Committee's (IRC) growing community gardening program called "New Roots" (to learn more, please see the New Roots page of the IRC's website). The organization now has community garden programs in six different US cities and is providing a model for other resettlement agencies and refugee organizations to emulate. This model typically combines nutrition education, microfinance opportunities, social support, local community engagement, and a connection to Earth and cultural heritage. These latter connections can be easily drowned out by the chaos and industrialized atmosphere of the cities refugees are typically resettled in. Because many refugees come from agrarian backgrounds, engaging in horticultural cultivation becomes an opportunity to contribute to broader community health as local experts.

Research on gardening, particularly in a community setting, shows dynamic benefits for physical, emotional, and psychosocial health as well as community beatification and cohesion. Psychological benefits of regular contact with nature, specifically when actively engaged in natural environments, include cognitive restoration, affective elevation, and increased perceptions of social support (see Table 1). Although refugee resettlement agencies and the ORR promote the multidimensional benefits of community gardening for refugees, there is very little empirical research deconstructing these observed benefits (Chase, 2012; Lindn & Grut, 2002).
## Table 1

Research examining the effects of gardening and contact with nature

<table>
<thead>
<tr>
<th>Reference</th>
<th>Population</th>
<th>Psychometric Strength</th>
<th>Primary Measures</th>
<th>Results</th>
</tr>
</thead>
</table>
| Hale, et al. (2011)  | 67 community garden participants; 28 urban gardens | Interview questions developed with community partnership, use of widely-used qualitative analysis procedures; though not experimental in design, valuable qualitative information was gathered | -Demographics  
-Qualitative interview questions developed for the study and pre-tested with community members | Qualitative results highlight the benefits of the socio-ecological learning process, gardeners’ aesthetic and cultural values are affirmed, participants’ overall health was impacted by gardening experiences,  
-Participants were more actively engaged in a horticultural activity than a traditional adult day service activities  
$t(47)=13.47, p < 0.001$  
-Participants demonstrated more positive affect in horticultural activities than traditional adult day service activities  
$t=5.15, p < 0.001$ |
| Jarrott & Gigliotti (2005) | 48 adults with dementia | Combination of well researched measures and measurements developed specifically for the study; strength of experimental design | -Demographics, MMSE  
-affective measurement tool designed for the study  
-structured interview assessing participant experience of the study activities |                                                                                                                                                               |
Research examining the effects of gardening and contact with nature

<table>
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</thead>
<tbody>
<tr>
<td>Kuo (2001)</td>
<td>145 Residents in urban public housing</td>
<td>One measure developed specifically for the study, based on a previously validated measure and refined via discussion with residents of the test area</td>
<td>-“Greenness Ratings” of surrounding area (independent raters) -Digit Span Backwards (DSB; attention) -Ineffective Management of Major Issues Scale (developed for the study) -self report of other areas affecting functioning</td>
<td>-Those with less nearby nature scored significantly lower on DSB than those with more nature ($t=-1.74$, $p=.05$) -The effect of “greenness” of surroundings on ability to manage life issues was mediated by attention (DSB) ($\beta=-2.87$, $p&lt;.05$)</td>
</tr>
<tr>
<td>Lee (2010)</td>
<td>-30 intellectually disabled participants of a South Korean rehabilitation center -20 intellectually disabled residents of a South Korean residential home</td>
<td>Appropriate use of heart rate variability and cortisol level analyses; strength of experimental design</td>
<td>-Heart rate variability analyzer (stress analysis) -cortisol saliva analysis</td>
<td>-Groups pressing flowers and potting flowers had decreased heart rate following these activities ($p&lt;.01$; $=,.04$) -Groups planting flowers showed decreased cortisol levels over 7 days ($p&lt;.01$)</td>
</tr>
<tr>
<td>Reference</td>
<td>Population</td>
<td>Psychometric Strength</td>
<td>Primary Measures</td>
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</tbody>
</table>
| Okvart & Zautra (2011)                      | N/A                                                                         | N/A                   | Review of current literature on the effects of community gardening and contact with nature | -Community gardens can contribute to stronger socio-ecological structures and community ties  
-Community gardening has potential to bolster cognitive and affective attributes  
-Community gardening can increase the strength of social networks |
| Simons, Simons, McCallum & Friedlander (2006) | Part of a longitudinal study of 2805 residents of an Australian nursing home (the current report is the result of 16 years of this study) | Measures consisted of medical indicators of health | -Records of daily activities and health checkups (standard medical, psychological and cardiovascular assessments risk-not described in full in this report) | Individuals who participated in daily gardening activities were 36% less likely to develop dementia |
| Stuart (2005)                               | 1,500 women and children participating in a gardening program at domestic violence shelters in CA | Only qualitative data was collected | Qualitative data collected via interviews with garden participants | -58% women who spent at 3 hours/week or less gardening, and 85% who spend 6 hours or less per week gardening reported increased therapeutic or |
Table 1 (continued)

*Research examining the effects of gardening and contact with nature*

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Stuart (2005) cont'd</td>
<td></td>
<td></td>
<td></td>
<td>positive feelings-themes of empowerment, increased adjustment to difficult circumstances, and positive effects for children</td>
</tr>
<tr>
<td>Van den Berg &amp; Custers (2011)</td>
<td>30 community gardeners in The Netherlands</td>
<td>Small sample size, but use of well-validated measures and data collection methods, strength of experimental design</td>
<td>-Stroop task (stress induction) -Cortisol measurements -Dutch adaptation of Positive and Negative Affect Schedule</td>
<td>Cortisol levels were found to be lower in a group engaged in gardening activities (versus a reading activity) following a Stroop task</td>
</tr>
<tr>
<td>Wakefield, Yeudall, Taron, Reynolds, Skinner (2007)</td>
<td>55 urban community gardeners participated in focus groups; 13 participated in interviews in Toronto, Canada</td>
<td>Qualitative data was gathered using protocols developed for the study, using multiple raters, qualitative analyses are widely used methods</td>
<td>Participant observations, focus groups, intensive interviews</td>
<td>Gardeners reported experiencing better nutrition, better access to healthy foods, increased physical activity, and improved mental health (including increased social engagement and individual empowerment)</td>
</tr>
</tbody>
</table>
Table 1 (continued)

*Research examining the effects of gardening and contact with nature*

<table>
<thead>
<tr>
<th>Reference</th>
<th>Population</th>
<th>Psychometric Strength</th>
<th>Primary Measures</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wichrowski et al. (2005)</td>
<td>107 cardiac rehabilitation inpatients</td>
<td>Reliable measures, administered before and after interventions</td>
<td>-Heart rate (pulse oximeter)</td>
<td>Participants who were in the horticultural therapy (HT) group showed significant decreases in heart rate and indicators of distress following HT; those who received the patient education class did not show significant decreases</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-POMS (asses transient emotional states)</td>
<td></td>
</tr>
</tbody>
</table>
COMMUNITY GARDENING: A NOVEL INTERVENTION

The Current Study

The goal of the proposed study is to evaluate whether active involvement in a community garden provides distinct psychological benefits for Bhutanese refugees residing in the US. Bhutanese refugee families have endured years of physical and psychological adversity following political oppression in Bhutan. Although many are now able to begin new lives free from political oppression and fears of torture, many Bhutanese refugees still suffer lingering effects of their past experiences. In addition, they are faced with the new challenges of navigating a new social and economic system as well as adapting to a new language and cultural norms. Community gardening has been shown to provide psychological and social benefits to low income or disabled populations, and the model is now being used to promote psychological restoration and self-sufficiency in refugee populations across the United States. Despite the growing popularity of refugee community gardens, there are no empirical psychological studies deconstructing the observed benefits. The hypothesis explored in this study was whether community gardening fosters psychological well-being among Bhutanese refugees. The following hypotheses were proposed:

1. It was expected that Bhutanese gardeners would self-report significantly fewer symptoms of distress, as measured by the Refugee Health Screener-15 and the Patient Health Questionnaire-15, than a non-gardening control group of Bhutanese refugees.

2. Bhutanese gardeners were anticipated to self-report significantly higher ratings of perceived social support than a non-gardening control group of Bhutanese refugees, as measured by the Medical Outcomes Survey Social Support Inventory (MOS SSI).

3. It was expected that participating in community gardening would mediate the association between perceptions of social support (MOS SSI) and adjustment (as measured by the Client Assessment Tool) among Bhutanese refugees.
CHAPTER III

METHODOLOGY

Participants

Participants were recruited from a sample of Bhutanese refugees residing in Fort Worth, Texas. Participants consisted of 62% female ($N = 31$), and 38% male ($N = 19$) adult (mean age = $44.5; SD = 15.01$) Bhutanese refugees, with 56% in the non-gardener condition ($N = 28$) and 44% in the gardener condition ($N = 22$). All participants reported their primary language as Nepali. Eighty percent were married ($N = 40$), 12% single ($N = 6$), 6% separated ($N = 3$), and 2% widowed ($N = 1$). The average age for participants was 44.5 years old ($SD = 15.01$). Twenty-six percent reported having completed “some school” ($N = 13$), 22% completed high school ($N = 11$), 6% had completed “some college” ($N = 3$), 4% reported obtaining a college degree ($N = 2$), and 42% reported receiving formal education ($N = 21$). Additionally, 38% reported completing another form of educational training, such as English as a Second Language classes, or employment readiness courses taught by refugee resettlement agencies ($N = 19$).

On variables assessing resources, 22% of participants reported currently having a case manager with a refugee agency ($N = 11$), 50% receive food stamps ($N = 50$), 54% use either Medicare or Medicaid ($N = 27$), and 64% reported being involved in a local Bhutanese community support group ($N = 32$). Mean monthly household income was $1,633.13 ($SD = 820.15$), with the mean household members at 4.64 ($SD = 1.56$). Six participants (12%) reported receiving mental health care in the past, and the average number of annual medical appointments was 9.91 ($SD = 10.38$). Additionally, participants reported spending an average of $128 per month on medical bills ($SD = 284$) and $500.94 monthly on groceries ($SD = 205.02$).
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Measures

Ethical research with non-native English speakers or participants whose primary language is one other than English requires the utilization of linguistically and culturally validated measures (Van Ommeren & Sharma 2000; Knipshcher & Kleber, 2006). In particular, Nepali language idioms and semantics should be taken in to consideration when investigating language used to describe psychological frameworks (Kohrt & Hruschka, 2010). Research with communities, particularly refugee communities, is thought to yield best results when a multimethod structure is employed (APA, 2010). For the purposes of this study, then, qualitative information was gathered in addition to usage of measures validated for research with refugee communities in the United States.

Refugee Health Screener-15

The Refugee Health Screener-15 (RHS-15) (Pathways to Wellness, 2011) is a 15-item screener for symptoms of PTSD, anxiety, and depression among refugees resettled in the United States. The screener was developed for use in public health settings as a means of identifying patients with significant mental health needs who would not be otherwise identified and referred for services. Translation was conducted via a process of "back-and-forth participatory consensus with refugees from each language group" and the screener is currently available in 7 languages, including Nepali (Pathways to Wellness, 2011). Items included in the screener were adapted from the following measures which have been developed for or validated with refugee populations: The New Mexico Refugee Symptoms Checklist-121 (NMRSC1-121; Hollifiell, Warner, Krakow, Jenkins, & Westermeyer, 2009), the Posttraumatic Symptom Scale-Self Report (PSS-SR; Foa, Riggs, Dancu, & Rothbaum, 1993), and the Hopkins Symptoms Checklist-25 (HSCL-25; Butcher, 1991; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). Items 1-13 of the resultant RHS-15 are rated on a Likert-type scale from 0 (Not at all) to 4 (Extremely). Item
12 is a lifetime rating of general adaptability with a scale rating that ranges from 0 [Able to handle (cope with) anything that comes your way] to 4 (Unable to cope with anything). Item 15 presents an illustrated distress thermometer with rating options from 0 (No Distress-"Things are good") to 10 (Extreme Distress-"I feel as bad as ever I have"). A total score of greater than 12 on items 1-14 or a score of 5 or more on the distress thermometer is considered indicative of need for referral to mental health services. For the current study, internal consistency (\(\alpha = .86\)) was high.

\textit{Patient Health Questionnaire-15 (PHQ-15)}

The PHQ-15 (Kroenke, Spitzer, deGruy, & Swindle, 1998) is a 15 item, open access, self-report scale measuring somatization syndromes and is derived from the Patient Health Questionnaire, which has been used previously with refugee populations (Mitschke, Aguirre, & Sharma, 2013). Patients endorse ratings on items of somatic complaints (stomach pain, back pain, dizziness, etc.) on a scale form 0 (Not bothered at all) to 2 (Bothered a lot). The PHQ-15 has strong internal consistency with \(\alpha = 0.82\) (\(M = 3.8, SD = 4.1\); Kocalevent, Hinz, & Brähler, 2013). Total scores of 5, 10, and 15 represent cut offs for low, medium and high somatic symptom severity, respectively (PHQ Instructions). Internal consistency of items on the PHQ-15 for the present study was acceptable (\(\alpha = .72\)).

\textit{Medical Outcomes Study Social Support Survey (MOS SSS)}

The MOS SSS (Sherbourne & Stewart, 1991) is a 19 item self-report measure of perceived social support evaluated from multiple dimensions. All items are rated on a Likert scale from 1 (None of the time) to 5 (All of the time). Originally developed as part of the two year Medical Outcomes Study (MOS), the measure has now been adapted for use in different settings and countries, including Canada (Anderson, Bilodeau, Deshaies, Gilbert, & Jobin, 2005), Portugal (Alonso Fachado, Montes Martinez, Menendez Villalva, & Pereira, 2007), Malaysia.
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(Mahmud, Awang, & Mohamed, 2004), and China (Yu, Lee, & Woo, 2004). The MOS SSS has been used in a previous research study with refugee groups in Fort Worth, Texas. This study reported a mean total on the MOS SSS of 68.31 (SD = 18.23; Mitschke, Aguirre, & Sharma, 2013). The measure is divided into 4 subscales: Emotional/informational Support (Cronbach's alpha of .96, convergent validity of r = .82-.90), Tangible Support (α = .92, r = .72-.87), Affectionate Support (α = .94, r = .80-.86), and Positive Social Interaction (α = .91, r = .87-.88). There is also an Additional Item: "Someone to do things with to help get your mind off things". Although this item did not load on to any of the other scales, it is still included in the measure as a gauge of tangible perceived social support (Sherbourne & Stewart, 1991). The extant literature reports that the total MOS SSS has an internal consistency of α = .97 (Sherbourne & Stewart, 1991). The current study evidenced good internal consistency of items overall (α = .89). With respect to the subscales, Positive Social Interaction demonstrated excellent internal consistency (α = .9), Emotional/Informational Support (α = .88) and Tangible Support (α = .85) evidenced good internal consistency, and Affectionate Support (α = .75) had acceptable consistency.

Semi-structured Interviewing

A semi-structured interview protocol (Appendix A) was used to assess for local acculturation, social support, and the specific impact of community gardening (comparison participants were asked different questions about gardening than garden participants). The protocol was developed based off feedback from local refugee resettlement agencies and Bhutanese community leaders, and provides qualitative information for consideration in this study. As part of the semi-structured interview, the researchers completed ratings on the “Adapted Client Assessment Tool” (see Appendix A3), which has been provided by a local refugee resettlement agency. The question pertaining to English proficiency had been adapted from a family unit focus ("Members of the household ....lack any English skills"), to an
COMMUNITY GARDENING: A NOVEL INTERVENTION

individual focus ("I lack any English skills"). This tool is used with all refugee case management clients to gauge their areas of need and current adjustment to living in Fort Worth. Ratings of 2 or below are followed up in the case management setting, therefore, referral information was provided to participants with ratings of 2 or less on any category. This measure demonstrated excellent internal consistency of $\alpha = .91$.

Procedures

A total of four Bhutanese community leaders (Cultural Ambassadors) with previous translation and interpretation training were recruited to assist with translation, participant recruitment, data collection, and interpretation. Cultural Ambassadors attended training on psychological research ethics, confidentiality, and learned how to administer the study measurements. These community leaders were also consulted throughout data collection and data interpretation processes to ensure accuracy and cultural salience. Although initially recruited as strictly volunteers, internal grant monies were subsequently secured that allowed for the interpreters to be compensated for their time, at a rate comparable to current local interpretation costs ($35 per participant). Two undergraduate and two graduate research assistants were also recruited to assist with data collection. All researchers were trained in general relevant cultural norms and practices, to foster ease of rapport, and in best practices when working with interpreters. All research assistants and Cultural Ambassadors completed NIH Research Involving Human Subjects Training and were trained in administration of all study measures.

During the Fall and Spring gardening seasons (2013-2014), the primary student investigator regularly attended weekly group work days at the Neighborhood Needs Community Garden in Fort Worth. During this time, the investigator was able to make on-site observations and build rapport with community members and leaders. Recruitment for the gardener condition consisted of attending a meeting held at the Neighborhood Needs community garden, where the
study purpose was explained and volunteers were solicited. Interested gardeners provided contact information and general availability following the meeting and, to protect confidentiality, participants were also provided with investigator contact information in order to sign up for the study. During the course of the study, participants informed researchers of a community garden space at an apartment complex where a large population of Bhutanese refugees resides. Recruitment of these participants occurred by word-of-mouth as well as via solicitation by Cultural Ambassadors during community meetings. Non-gardener comparison group participants were recruited also by word-of-mouth and Cultural Ambassador solicitation during community events and meetings. All participants volunteered without expectation of compensation. Internal grant money was subsequently obtained, however, to compensate all participants for their time ($15 per participant).

Following recruitment, the researchers and cultural ambassadors scheduled times to meet with each participant for data collection. Participants were provided options of meeting places: a community room at the garden or their apartment complex, their own home, or the home of community volunteers who opened their apartments for the purpose of the study. The IRB approved consent form (Appendix C) was translated into Nepali by a professional translation firm with an established track record and good reputation among the refugee agencies serving the Fort Worth Bhutanese community. Participants were provided a copy of the informed consent form (see Appendix C.3) to keep for their records. Participants were given the option to complete measures independently (in English or Nepali, at their preference) or for measures to be orally administered in Nepali. Only two participants elected to complete measures on their own. Orally administered measures and questions were interpreted aloud by Cultural Ambassadors, who also provided clarification for any participant questions related to cultural or linguistic nuances. Participant were assigned an identification number that was used throughout data collection.
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Names were not attached to any measurements or qualitative data. Names and contact information were recorded on a master spreadsheet with identification numbers, and kept in a secure location within the research lab of Terrill Hall. Following study completion, this list will be shredded. Signed informed consent forms are stored in a locked file cabinet in the faculty member PI’s office. These consent forms will be maintained in a locked location for three years and then will be shredded. They may be shredded earlier if they are first scanned for electronic storage. All data collected will be stored in a secure location within the research lab and retained in keeping with the institutional review board approval.

Scores on the RHS-15 and PHQ-15 were calculated immediately following administration, and referrals to local resources (i.e. case management, mental health care, community support groups, professional health care) were provided for participants who scored greater than 12 on items 1-14 (N = 16) or 5 or more on the distress thermometer (N = 19) of the RHS-15, or who scored more than 5 on the PHQ-15 (N = 27) if they were not already receiving services for identified needs (see Appendix A.3 for a list of local resource referrals used in this study).
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CHAPTER IV

RESULTS

Data Cleaning

All measures were either completed in the presence of a researcher, or orally administered by a researcher. Therefore, missing data was only present on items which were potentially non-applicable to certain participants (i.e. questions about child care). These missing variables did not affect analyses, as all analyses were conducted using total scale scores (save calculating coefficient alpha for internal reliability of measures). Based on box plots and Tukey interquartile ranges, no significant outliers were identified in the dataset.

Descriptive Analyses

Independent samples $t$-tests were conducted to examine whether there are group differences between gardeners and non-gardeners on any of the demographic variables. Gardening and non-gardening groups were homogenous on all demographic variables other than housing, and medical bills, with gardeners having significantly higher frequency of living in a house than non-gardeners [$\text{Levene's } F(2, 48) = 23.94, p < .001$], and non-gardeners ($M = 193.59, SD = 359.29$) having significantly higher medical bills than gardeners [$M = 43.81, SD = 92.13; \text{Levene's } F(2, 48) = 6.76, p = .012$]. A Bonferroni correction was conducted to reduce the probability of a Type 1 error. See Table 2 for descriptive statistics and frequencies by study condition.
Table 2

Demographics by Condition

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Gardener M (SD)</th>
<th>Non-Gardener M (SD)</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>46 (14.32)</td>
<td>43.32 (15.69)</td>
<td>.18</td>
</tr>
<tr>
<td>Time in USA (months)</td>
<td>39.78 (27.55)</td>
<td>31.46 (17.17)</td>
<td>.36</td>
</tr>
<tr>
<td>Grocery Bills (monthly)</td>
<td>470.23 (180.08)</td>
<td>526.92 (224.16)</td>
<td>.28</td>
</tr>
<tr>
<td>Medical Bills (monthly)</td>
<td>43.81 (92.11)</td>
<td>193.59 (359.29)</td>
<td>.57</td>
</tr>
<tr>
<td>Dr. Frequency per Year</td>
<td>9.93 (12.22)</td>
<td>9.89 (8.91)</td>
<td>.003</td>
</tr>
</tbody>
</table>

Frequencies

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>2 (9.1%)</td>
<td>4 (14.3%)</td>
</tr>
<tr>
<td>Married</td>
<td>18 (81.8%)</td>
<td>22 (78.6%)</td>
</tr>
<tr>
<td>Separated</td>
<td>1 (4.5%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (4.5%)</td>
<td>0</td>
</tr>
<tr>
<td>Some School</td>
<td>8 (36.4%)</td>
<td>5 (17.9%)</td>
</tr>
<tr>
<td>High School Completed</td>
<td>5 (22.7%)</td>
<td>6 (21.4%)</td>
</tr>
<tr>
<td>College Degree</td>
<td>1 (4.5%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Other</td>
<td>7 (31.8%)</td>
<td>12 (42.9%)</td>
</tr>
<tr>
<td>Case Manager</td>
<td>4 (18.2%)</td>
<td>7 (25%)</td>
</tr>
<tr>
<td>Food Stamps</td>
<td>12 (54.5%)</td>
<td>13 (46.4%)</td>
</tr>
<tr>
<td>Medicare/Medicaid</td>
<td>13 (59.1%)</td>
<td>14 (50%)</td>
</tr>
<tr>
<td>Community Support Group</td>
<td>17 (77.3%)</td>
<td>15 (53.6%)</td>
</tr>
</tbody>
</table>

Analyses for Hypothesis 1

To address the first hypothesis (Bhutanese gardeners will self-report significantly fewer symptoms of distress, as measured by the Refugee Health Screener-15 and the Patient Health Questionnaire-15, than a non-gardening control group of Bhutanese refugees), independent samples t-tests were used to examine the effects of gardening on these variables. Assumptions of independent samples, a normal distribution, and homogeneity of variances were confirmed, no data was transformed, and there were no patterns of missing data (1.14% total missing data). Distress in Gardeners versus Non-Gardeners was not significantly different as indicated by the Refugee Health Screener. There was, however, a small to medium effect size (d = .35), for scores on the Patient Health Screener-15, with Gardeners ($M = 7.41$, $SD = 5.05$) evidencing greater levels of somatic complaints, than Non-Gardeners ($M = 5.71$, $SD = 4.56$). This difference,
however, was not statistically significant (see Table 3). When examining the effect size, it is notable that the observed effect was opposite of the expected direction. Thus, the first hypothesis was not supported by this data.

Table 3

*Independent Samples t-test for Group Differences in Distress*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Condition</th>
<th>M</th>
<th>SD</th>
<th>Levene’s F &amp; p</th>
<th>t(48)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHS Total</td>
<td>Gardener</td>
<td>11.55</td>
<td>9.17</td>
<td>.39 .20</td>
<td>.74</td>
<td>.39</td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>11</td>
<td>9.91</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RHS Distress</td>
<td>Gardener</td>
<td>3.68</td>
<td>2.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>3.52</td>
<td>3.27</td>
<td>.19 .85</td>
<td>.39</td>
<td>.54</td>
</tr>
<tr>
<td>PHQ Total</td>
<td>Gardener</td>
<td>7.41</td>
<td>5.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>5.71</td>
<td>4.56</td>
<td>.22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* RHS Total: Refugee Health Screener-15 total score; RHS Distress: Refugee Health Screener-15 distress thermometer; PHQ: Patient Health Questionnaire-15 total score

Analyses for Hypothesis 2

The second hypothesis (Bhutanese gardeners will self-report significantly higher ratings of perceived social support than a non-gardening control group of Bhutanese refugees, as measured by the Medical Outcomes Survey Social Support Inventory) was also evaluated using an independent samples *t*-test. Prior to completing this analysis, the following assumptions were checked: all variables are interval measurements, the sample distribution is normally distributed, there is a linear relationship between variables, no outliers were identified, and it was not necessary to transform any data. Garden condition was shown to predict social support overall, with gardeners (*M* = 61.32, *SD* = 13.21) reporting higher levels of social support than non-gardeners (*M* = 52.46, *SD* = 12.08), *t*(48) = 2.47, *p* = .017 (see Table 4). The effect size of this difference was medium to large (*d* = .70). In addition to conducting a *t*-test for the total score of social support, individual analyses were also conducted for each subtest (emotional/
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informational support, tangible support, affectionate support, and positive social interaction).

Gardeners \( (M = 15.45, SD = 3.02) \) significantly reported more tangible social support than non-gardeners \( [M = 12.57, SD = 3.47; t(48) = 3.07, p = .004] \), with a large effect size \( (d = .89) \).

Although a medium effect size was observed for emotional/informational social support \( (d = .53) \) and small to medium effects were observed for affectionate support \( (d = .34) \) and positive social interaction \( (d = .31) \), these effects were not significant. Hypothesis 2, that Bhutanese gardeners experience more social support than non-gardeners, was therefore supported, with the data indicating that pathways of tangible support and emotional/informational social support are particularly impacted.

Table 4

*Independent Samples t-test for Group Differences in Social Support*

<table>
<thead>
<tr>
<th>MOS Support Scale</th>
<th>Condition</th>
<th>M</th>
<th>SD</th>
<th>Levene’s F</th>
<th>p</th>
<th>t(48)</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional/Informational</td>
<td>Gardener</td>
<td>23.09</td>
<td>6.63</td>
<td></td>
<td></td>
<td>.30</td>
<td>.59</td>
<td>.88</td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>19.57</td>
<td>6.60</td>
<td></td>
<td></td>
<td>.98</td>
<td>.33</td>
<td>.004*</td>
</tr>
<tr>
<td>Tangible</td>
<td>Gardener</td>
<td>15.45</td>
<td>3.07</td>
<td></td>
<td></td>
<td>.38</td>
<td>.54</td>
<td>.34</td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>12.57</td>
<td>3.47</td>
<td></td>
<td></td>
<td>5.44</td>
<td>.02</td>
<td>.291</td>
</tr>
<tr>
<td>Positive Social Interaction</td>
<td>Gardener</td>
<td>9.73</td>
<td>2.95</td>
<td></td>
<td></td>
<td>9.73</td>
<td>.02</td>
<td>.291</td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>8.64</td>
<td>3.97</td>
<td></td>
<td></td>
<td>8.64</td>
<td>.02</td>
<td>.291</td>
</tr>
<tr>
<td>MOS Total</td>
<td>Gardener</td>
<td>61.32</td>
<td>13.21</td>
<td></td>
<td></td>
<td>.002</td>
<td>.96</td>
<td>.017*</td>
</tr>
<tr>
<td></td>
<td>Non-Gardener</td>
<td>52.46</td>
<td>12.08</td>
<td></td>
<td></td>
<td>52.46</td>
<td>12.08</td>
<td>.017*</td>
</tr>
</tbody>
</table>

*Note:* * indicates significant values at \( p < .01 \)

Analyses for Hypothesis 3

The third hypothesis was specified as: It was expected that participating in community gardening would mediate the association between perceptions of social support (MOS SSI) and
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adjustment (as measured by the Client Assessment Tool) among Bhutanese refugees. Before testing this hypothesis, the frequency (e.g., twice weekly), duration (e.g., 60 minutes each session), and length (e.g., 4 weeks) of gardening were entered into an equation (Intensity = ([frequency x duration] x length) to create a continuous variable indicative of gardening intensity for each gardener. The association of gardening intensity to social support (as measured by the MOS SI) and adjustment (as measured by the Client Assessment Tool) was then assessed. Although a significant association was observed between adjustment and gardening intensity, no significant association between adjustment and social support was revealed (see Table 5), precluding the presence of mediation (Baron & Kenny, 2004).

Table 5

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Emotion/Information</td>
<td>21.12</td>
<td>6.78</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Tangible</td>
<td>13.84</td>
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<td>.18</td>
<td>-</td>
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<td>3. Affection</td>
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<td>.65***</td>
<td>.39**</td>
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<tr>
<td>4. Positive Social Interaction</td>
<td>9.12</td>
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<td>.44***</td>
<td>.07</td>
<td>.61***</td>
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<td>5. Total</td>
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<td>13.23</td>
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<td>.48***</td>
<td>.87***</td>
<td>.68***</td>
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<td>6. Adjustment</td>
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<td>.16</td>
<td>.07</td>
<td>.11</td>
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<td>7. Garden Intensitya</td>
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</table>

*Only computed for those in the gardening condition (n = 22), all other correlations reflect the full sample (n = 50). * indicates significant values at p < .05, ** p < .01, *** p < .001

Exploratory Analyses

Additional correlational analyses were conducted to examine relationships between participant time in the USA, age, and each of the dependent measures. Participant adjustment (as measured by the Adapted Client Assessment Tool) was significantly related to time in the USA (r = .30, p = .033), with functional adjustment increasing with time (see Table 6). Age was positively associated with symptoms of distress and somatic complaints, as measured by the RHS-15 Total score (r = .34, p = .014), the RHS-15 Distress scale (r = .30, p = .033), and the
PHQ-15 ($r = .29, p = .043$). Age was additionally significantly related to perceived emotional/informational social support ($r = -.38, p = .007$), with perceived support decreasing with age.
Table 6

_Pearson Correlations of Relationships between Time in the USA and Outcome Measures_

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
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<th>10.</th>
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<td>1. Time in USA (months)</td>
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<td>2. RHS Total</td>
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<td>3. RHS Distress</td>
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<td>3.00</td>
<td>.21</td>
<td>.51**</td>
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<td>4. PHQ-15 Total</td>
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<td>-.27</td>
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<td>-.18</td>
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<td>/Informational</td>
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<td>7. MOS Affection</td>
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<tr>
<td>8. MOS Positive Social Interaction</td>
<td>9.12</td>
<td>3.57</td>
<td>.18</td>
<td>-.20</td>
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<td>-.09</td>
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<td>.61**</td>
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<td>9. MOS Total</td>
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<td>10. Adjustment</td>
<td>37.90</td>
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<td>-.38**</td>
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<td>11. Age</td>
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<td>.30*</td>
<td>.29*</td>
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<td>-.08</td>
<td>-.03</td>
<td>-.18</td>
<td>-.27</td>
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</tbody>
</table>

_Note:_ * indicates significant values at $p < .05$, ** $p < .01$, *** $p < .001$
Community Gardening: A Novel Intervention

Qualitative Data Analysis

All participants were administered a semi-structured interview by research assistants, with questions specific to gardening varying by condition (See Appendix E for all questions). The process of Consensual Qualitative Research (CQR; Hill, Thompson, & Williams, 1997) was used to analyze qualitative data gathered from these interviews. Prior to describing results, the analysis process will first be detailed. As recommended by Hill, Thompson and Williams (1997), eight cases from the gardener condition were selected. Because qualitative data was limited for various reasons (see Limitations section for more detail in this regard), these cases were chosen based on content quantity. Answers to interview questions were first transcribed, then two research assistants, trained in CQR, underwent the coding process which was periodically audited by the primary student investigator. Coders were asked to read provided articles on the CQR process (Hill, Thompson, & Williams, 1997; Hill et al., 2005) and familiarize themselves with the process. The primary student investigator then orally walked coders through the process and discussed any questions or concerns. At each step of the coding process, coders first worked together on example cases, selected from the gardener condition but not used in analyses, until they were comfortable coding consistently.

Prior to the first step of coding, the primary student investigator and coders developed an initial list of Domains expected for the data (see Table 7 for a summary of Domains, Categories, and Frequencies), all Domains were also numbered for ease of coding. Initial Domains were developed based on a review of the relevant literature regarding refugee and Bhutanese populations as well as community gardening experiences. Additional Domains were developed, changed, and some dropped, in accordance with Hill, Thompson and Williams (1997) procedures, as coders became more familiar with the data set. Specifically, the initial Domains of “Reliance on Others” and “Community Connection” were dropped because information falling
COMMUNITY GARDENING: A NOVEL INTERVENTION

under these Domains better fit other existing Domains. The Domain “Encountering Beauty” was changed to “Mindfulness/Sensory Experience” after further review and upon coder agreement on more effective wording for this area.

Coders independently coded individual transcripts then joined to discuss any differences to reach a consensus version of code assignments. The primary student investigator served as the “auditor” throughout the CQR process by reading all consensual code assignments, pointing out any inconsistencies or potential mis-assignments, and moderating discussion to consensual agreement when there was confusion or disagreement among coders. After coders reached consensus coding on all individual transcripts, they worked together to construct Core Ideas, or abstracts, for each transcript’s Domains. Thus, each participant protocol scored had Core Ideas summarizing their individual experiences within the assigned Domain. While this step is often initially carried out independently, followed later by consensus, Hill et al. (2005) has suggested consensual construction of Core Ideas can lead to more robust discussion and understanding of the data. Core Ideas were therefore generated jointly by coders and later audited by the primary student investigator. Any disagreements or inconsistencies were addressed as a team. The final step in CQR, was for coders to jointly construct Categories which represent information expressed in each Core Idea across participants. This process allows for cross-analysis of the data, interpretation, and generalizability to the sample. Categories are developed solely from the data itself, to lend an understanding of individual or sample experiences. Again, coders worked as a team, agreeing upon appropriate categorizations with the primary student investigator serving as the auditor following consensus.

All initial coding was done by hand and later transcribed, save the final step of developing Categories, which was done by typing categories into a spreadsheet during the coding process. This entire process of CQR was also carried out for 4 Non-Gardener participants.
COMMUNITY GARDENING: A NOVEL INTERVENTION

Although this number does not meet recommended qualitative analysis conventions, four cases were found to have quantitatively contributed a significant amount of information that the student investigator determined could be explored. Again, this decision was based on the quantity of information, without reading responses directly. Relevant Categories are included in Table 5, though the standard analytical conventions were not applied. This process was used to conceptualize, on a small level, the non-gardener population in the hopes of also providing a voice there.

Qualitative Results

Results were analyzed using the most recent conventions offered by Hill, et al. (2005) to describe information gathered from examining Category frequencies. Specifically, results which applied to all or all but one case were labeled “general”, results which applied to more than half (but less than all or all but one) cases were termed “typical”, two to four cases represented in a Category were labeled “variant”, and findings from only a single case were excluded from analyses. These conventions are used to describe findings in relation to the sample as a whole.

In terms of practical adjustment indicators, gardeners generally reported being aware of how to maintain and adhere to requirements of their refugee status (i.e. obtaining all necessary documentations and adhering to medical examination requirements). Gardeners also generally reported feeling moderately to well-adjusted to living in the United States. Gardeners typically reported feelings of self-efficacy; specifically, feeling confident to advocate for one’s self in a work context, communicate with a child family member’s school, or attend medical appointments independently. Variant responses indicate gardeners are engaged in the process of learning English, while results indicated gardening participants typically felt their limited English proficiency acts as a barrier to meeting needs or adjusting. A varying degree of gardening participants were unemployed in this sample. Additionally variant, gardeners
discussed different consequences of their status as refugees. In gardeners this was characterized by noting their children now have opportunities to attend school and living conditions are an improvement from the past. Alternatively, non-gardener responses reviewed indicated distinct struggles with navigating new systems and a multitude of barriers throughout their transition process, as well as an inability own land and animals.

In terms of practical social support, gardeners generally reported living with family members, knowing family members and friends within their immediate community, having access to a vehicle within the family, and generally found out about community gardening opportunities through neighbors or community leaders. Gardeners typically reported knowing family or friends in the area before moving to Fort Worth and receiving help from others in their transition to life in the United States (i.e. learning how to access public benefits, learning bus routes, obtaining documentations, finding jobs, etc.). Gardeners also typically reported having help from family members or friends to maintain their community garden plot and indicated the garden was a place to share practical information with each other (i.e. which seeds to use for planting, where to access public benefits, etc.).

Related to health and financial concerns, gardeners’ variant reports indicated they have struggled with pre-existing health concerns and financial barriers to meeting their family needs, in addition to utilizing public financial benefit services. Despite reported financial struggles, gardeners typically reported being able to save money on produce by using crops they had grown at the community garden. Results indicating health benefits or improvements related to gardening were found to be variant. Specifically, gardeners reported experiencing health improvements such as alleviation of dizziness and visual strain as a result of spending time in the community garden. Additionally, gardeners discussed receiving nutritional benefits from eating their garden produce or sharing it with sick family members. Gardeners also discussed reaping
benefits such as stretching and getting exercise while in the garden. Several gardeners also noticed positive changes in mental health in themselves and others, as a result of garden participation. Specifically, one gardener reported:

“If our mind is thinking deeply or wandering, if I go to my plot it turns mind to useful. As the seeds grow, so our minds grow too. If there would be a big garden I’d make it well decorated so our mind will also get relief there.”

Related, one non-gardener detailed his experience with his conceptualization of mental illness as follows:

“Only a single person in a room sitting, it creates mental illness. It’s all about the money. I could have bought a big house and big land. I left it all in Bhutan. Always thinking of that, it makes a mental illness. If there had been a small land it would go. But we don’t have anything. We don’t have animals, we don’t have land, we don’t have anything. It makes mental illness.”

In addition to specific accounts of observed health and mental health relationships to gardening, a variant result of opportunities for mindfulness and sensory awareness was also evident. Gardeners discussed an appreciation for the opportunity to “touch some soil,” take in greenery, taste delicious produce, and watch things grow from the earth. When discussing the taste of produce, participants often described the taste as superior to grocery store produce. A more typical, and related result was that gardening fostered a sense of independence. Many participants talked about a deep appreciation for being able to support their family with the produce they had grown, or to individually reap the benefits of earnest hard work. Several participants conveyed taking pride in growing produce with their own hands, which they could share with others or use to support themselves.

As evidenced by general results in the qualitative data, community gardening serves as a way for individuals to connect with their cultural roots. In general, gardeners reported having engaged in some type of cultivation prior to moving to the United States. When asked about
previous gardening experiences, many participants listed the animals they cared for or the crops they grew in Bhutan. Many (variant) participants stated they had learned how to cultivate produce from their parents or grandparents while still children in Bhutan. Gardeners also generally had access to some type of gardening experience while residing in Nepal, ranging from “kitchen gardens” or potted plants, to community gardens similar to those of participants in the current study, and even working as hired farm labor outside the refugee camp.

Participants were asked about topics of conversation at the current community gardens. In general, participants reported they often discuss memories of Bhutan and Nepal. One participant became friends with an Iraqi family at their apartment complex’s garden, where they share stories of their respective home countries with each other. Other participants stated they felt like they were back in Bhutan when at their garden plot. In general, participants claimed to have developed new relationships with fellow gardeners, and typically were able to improve upon established relationships via this shared experience. Another general finding was participants pray for the health and production of their crops when planting seeds or seedlings. Many of the plants cultivated, such as mint and certain flowers, are used in religious ceremonies or practices.

Finally, in general, participants reported current garden spaces are too small for their desires and needs. Although gardeners also typically grow plants at home, often in pots, gardeners consistently expressed desires for larger garden plots closer to their apartment complexes. Some participants expressed confidence they would be able to experience significant financial savings by not having to purchase produce if they were allotted larger growing spaces. All non-gardeners reviewed also stated they were limited in garden participation by accessibility issues. Garden locations were described as being too far away, with transportation too difficult to secure regularly.
COMMUNITY GARDENING: A NOVEL INTERVENTION

Participant Feedback on Results

Following conclusion of data analyses, the primary student investigator, along with one of the Cultural Ambassadors, met with two groups of participants to provide study results and solicited further relevant insight or feedback, from an emic perspective. The group meetings were held at common meeting places at two different apartment complexes, one located near the community garden and also containing community garden plots itself; and another located a fifteen to twenty-minute drive from the identified community garden. Eleven participants were present at the former meeting, with all but one having current access to a plot; and seven were present at the latter meeting, all of whom were non-gardeners.

The student investigator presented hypothesized hypothesis, outcomes, as well as results of qualitative analysis. In regards to analysis results from Hypothesis 1, one gardener responded (with affirmations from all other gardeners in attendance):

“It makes sense! The youths who are able have to go to work. The people not able to work or are of the age to live at home – they can go out and garden. They want to see the greeneries, but they can’t work. So, those who are not able to do other things can still do.”

Non-gardeners proposed perhaps the health of those with access to community gardens was affected by sudden and frequent changes in weather. They also remarked, however, that the people they know at their apartment complex who do go to the garden always seem to look healthier than those “sitting at home on the sofa”.

Regarding Hypothesis 2, gardeners generally affirmed findings: they perceived attaining social support and developing strengthened social networks via garden participation. Non-gardeners also supported the findings by remarking people are able to better establish connections when actively engaged together. Specifically, one non-gardener remarked:
"They get opportunity to go talk with people with gardening and sharing ideas and absolutely they get more social support than we living confined in houses."

Hypothesis 3 proposed social support mediates a relationships between garden participation and adjustment. When the results were presented to gardeners, participants told the student investigator although they may outwardly state they feel well-adjusted, the majority of community gardeners are elderly and are limited by various barriers to practical adjustment such as language acquisition, transportation, employability, and physical ability. When further queried about responses on a question regarding self-rated adjustment in the semi-structured interview, gardening participants all laughed and indicated they do not feel comfortable voicing their problems in certain contexts. Specifically, one gardener commented:

“When you say ‘How are you?’ no one says ‘I’m bad’, even when I have problems inside. And it’s one of the first phrases we learn in English.”

One gardener, who was observably younger than other participants at the meeting stated:

“The elder people don’t have other option than saying ‘I’m adjusted’ because likely to be inside the house with closed doors. They want to go outside and talk but language and transportation barriers. They feel like ‘What else is there I can say?’

During these meetings, all participants expressed a desire for greater availability of gardening space. Gardeners, although grateful for opportunities to cultivate a small plot, discussed a need for larger plots to increase financially beneficial harvests. Gardeners and non-gardeners alike asserted lack of transportation was a barrier to participating in a garden, as most households have one car, which is used by working family members. All participants joined in expressing their limitations based on age, physical disabilities, and language barriers, and said they were unable to ask capable family members to advocate for additional cultivating opportunities because these family members have to work to support the family units. One garden participant specifically proposed:
“If garden opportunities, should not be through the refugee agencies, but come to the ground. If places want to give opportunities they should come to the ground and have these programs be run by the people so the most needy actually get help. We know their needs.”

Finally, during feedback with the group of primarily non-gardeners, after discussing study findings, participants turned conversation to other primary concerns. Specifically, obtaining citizenship is a large source of distress for aging individuals, who will lose access to any public benefits if they are unable to establish citizenship within the first seven years of residency. One participant in particular said that she never had formal schooling as a child. As part of the citizenship test she would be required to answer paper and pencil questions in English. Though she has been in ESL and citizenship classes for three years, she is still unable to write the alphabet without looking at a cheat sheet. Other participants joined her in stating they feel as if they have nowhere to belong and nothing to do with themselves. All participants during the feedback process asked for advocacy on their behalf, in order to gain access to opportunities that could enable them to once again be contributing members of their families and communities.

Table 7

Consensual Qualitative Research Analysis Results: Domains, Categories, Frequencies and Respondents

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<tr>
<th>Domains</th>
<th>Categories</th>
<th>Frequency</th>
<th>Respondents</th>
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</thead>
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<tr>
<td>1. Practical Social Support</td>
<td>A. Lives with family members</td>
<td>General</td>
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</tr>
<tr>
<td></td>
<td>B. Had family/friends in area prior</td>
<td>Typical</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>C. Has family/friends in area currently</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>D. Transportation within family</td>
<td>General</td>
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<tr>
<td></td>
<td>E. Receives financial help from family</td>
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<tr>
<td></td>
<td>F. Family/friends help with plot maintenance</td>
<td>Typical</td>
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</tr>
<tr>
<td></td>
<td>G. Received help with coming to US</td>
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<tr>
<td></td>
<td>H. Heard about plot from someone</td>
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<tr>
<td></td>
<td>I. Received help with adjustment</td>
<td>Typical</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>J. Helped others</td>
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</tr>
<tr>
<td></td>
<td>K. Helped others with garden things</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>L. Receiving help with public benefits/documentation</td>
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<tr>
<td>2. Emotional Social Support [And K. (17) J. Helped others (08)]</td>
<td>M. Garden is a place for sharing</td>
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<tr>
<td></td>
<td>N. Talked about country of origin</td>
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<td>8</td>
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</table>

UU. Talking and Sharing within community

| Respondents | 1 |
Table 7

Consensual Qualitative Research Analysis Results: Domains, Categories, Frequencies and Respondents

<table>
<thead>
<tr>
<th>Domain</th>
<th>Category</th>
<th>Variant</th>
<th>Frequency</th>
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<tr>
<td>3. Health Problems</td>
<td>O. Various Preexisting Health struggles</td>
<td>Variant</td>
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<td>4. Health Improvement</td>
<td>P. Health improvement related to garden</td>
<td>Variant</td>
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<td></td>
<td>Q. Medical experience better in US</td>
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<tr>
<td>5. Financial Problems</td>
<td>R. Financial barriers to meeting family needs</td>
<td>Variant</td>
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<td>6. Financial Benefits</td>
<td>S. Saved money from garden</td>
<td>Typical</td>
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<tr>
<td></td>
<td>T. Financial benefits (gov’t related)</td>
<td>Variant</td>
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<tr>
<td>7. Mindfulness/Sensory Experience</td>
<td>U. Garden provides opportunities for mindfulness</td>
<td>Variant</td>
<td>4</td>
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<tr>
<td></td>
<td>V. Enjoys the taste of greens</td>
<td>Variant</td>
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<td>8. &quot;Other&quot;</td>
<td>W. Refugee status has consequences</td>
<td>Variant</td>
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<td>10. Teaching/Learning</td>
<td>X. In process of learning English</td>
<td>Variant</td>
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<td></td>
<td>Y. In Process for Citizenship</td>
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<tr>
<td>11. Language Barriers</td>
<td>Z. Limited by lack of English proficiency</td>
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<td>12. Reconnection with Bhutan/Nepal</td>
<td>AA. Used to work garden in past</td>
<td>General</td>
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</tr>
<tr>
<td></td>
<td>N. Talked about country of origin</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td>13. Culture/Tradition</td>
<td>BB. Gardening in relation to religion</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>AA. Used to work in garden in past – childhood</td>
<td>Variant</td>
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<tr>
<td>15. Mental Health changes</td>
<td>CC. Gardening related to peaceful, happy feelings and lowers stress</td>
<td>Variant</td>
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<tr>
<td>16. Nutrition</td>
<td>DD. Receive nutrition from garden plants</td>
<td>Variant</td>
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<tr>
<td>17. Independence</td>
<td>EE. Self-efficacy</td>
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<tr>
<td></td>
<td>FF. Financial independence</td>
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<td></td>
<td>GG. Garden facilitates independence</td>
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<td>5</td>
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<tr>
<td>20. Change in relationships</td>
<td>HH. New relationships fostered by garden</td>
<td>General</td>
<td>8</td>
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<tr>
<td></td>
<td>II. Strengthening of relationships related to garden</td>
<td>Typical</td>
<td>6</td>
</tr>
<tr>
<td>21. Physical Activity</td>
<td>JJ. Garden helps with exercise</td>
<td>Variant</td>
<td>4</td>
</tr>
<tr>
<td>22. Gardening “other”</td>
<td>KK. Frequency of garden engagement</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>LL. Discussion of specific produce</td>
<td>Typical</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MM. Grows at home</td>
<td>Typical</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>TT. Preference for more space in garden</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>XX. Gardening is an experience of something living</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>YY. Barriers to accessing a community garden</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>23. Practical Adjustment</td>
<td>NN. Benefits/health screenings, and knowledge of healthcare policy</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>OO. Has documents or is in process</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>PP. Sees a doctor regularly</td>
<td>Typical</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>SS. Evaluation of Adjustment</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>VV. Desire for garden to help with adjustment/health</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WW. Unemployed</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>24. Life Story</td>
<td>QQ. Came directly to Fort Worth</td>
<td>Typical</td>
<td>5</td>
</tr>
<tr>
<td>25. Employment</td>
<td>RR. Employed</td>
<td>Variant</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: Italic* indicates categories added from non-gardener analysis, standard conventions not applied due to small sample size (N = 4).
The aim of the present study was to investigate whether Bhutanese refugees participating in a community garden would evidence higher indicators of psychological well-being than those not participating in this activity. Sample participants were recruited from a local Bhutanese refugee community, via word-of-mouth and solicitation at community events. All data collection was done at a location of participant choosing, typically within their own apartments or the apartment of a community leader who opened their home for the study purpose. Both quantitative and qualitative data were collected from individual participants, and preliminary results were discussed with two groups of participants at study conclusion to foster a more robust understanding and interpretation of results.

The first hypothesis proposed, specifically, was that gardeners would evidence fewer symptoms of distress and somatic complaints than non-gardeners. Although this hypothesis was not supported by the current sample, it is worth discussing the observation that gardeners seemed to evidence higher reports of somatic complaints, despite this finding being statistically non-significant. Without a larger sample size and more adequate assessment methodologies, it is difficult to determine the nuances within this relationship. In presenting results to garden participants however, they offered the explanation that individuals participating in the community gardens are typically elderly or unable to work, and therefore likely experience greater rates of chronic health problems. Although this offers an appealing explanation, that those with the available time and greatest need of garden participation are typically more physically limited, no group inherent differences between conditions were observed on variables of distress and health. To the contrary, group differences were observed in monthly medical bills, with non-gardeners reporting significantly higher amounts, though this could also be related to...
availability of social support in attaining financial and public services. Additionally, gardener and non-gardener participants noted observing health improvements in their neighbors who had access to gardening.

In comparison to the norms for the measure of somatic complaints, gardeners and non-gardeners alike appear to be experiencing high levels of distress in general (PHQ-15; Kocalevent, Hinz, & Brähler, 2013). This then raises the question of accurate personal appraisals. Initial concerns in this regard were addressed during data collection by carefully explaining response scales to participants, using depictions provided by test developers as well as Cultural Ambassador anecdotal explanations, to ensure participants accurately understood they were being asked to rate their individual experiences on a defined scale. Despite all explanations, though, there are two possible issues that may be impacting quantitative outcomes. In the group feedback meeting garden participants raised the point that to complain about their adverse situations felt meaningless, as there was no expectation of change. Perhaps, for individuals who have faced decades of ostracization, persecution, and survival-focused living, suffering is a normal experience. To experience chronic pain, ongoing somatic complaints, or psychological strain may be a constant state that is difficult to step outside of and evaluate objectively, even with fluctuations or changes. Additionally, participants were asked to rate their individual experiences, how much they were bothered personally by symptoms. This can be a difficult perspective to take for someone whose referential framework is typically more socially/communally than individually based. Support for this interpretation is supported by comparing observations made during individual interviews and group feedback meetings. Participants were comparatively more open about shared group adversities and frustrations in a more communal forum than individually with researchers, who may have been viewed as closely aligning with a society to which they struggle identifying as well. Although these propositions
COMMUNITY GARDENING: A NOVEL INTERVENTION

may not cleanly explain differences in qualitative and quantitative data, they serve to highlight the importance of well-rounded research approached not only from standardized conventional perspectives, but also from the frameworks of populations being evaluated or worked with.

It is worth noting here only 12% ($N = 6$) of study participants reported a history of receiving mental health care. While this may be consistent with reports of negative stigma associated with seeking mental health care (Kohrt & Hruschka, 2010) and with the current quantitative results, qualitative findings again prompt a closer examination of conceptualization and approach. Both individually and during group forums, participants discussed the importance of staying active for mental health. Participants talked about the various benefits of physical activity and the peaceful effects of being surrounded by greenery and feeling reconnected to their home countries (also supported by reports from Chase, 2012; Kohrt & Hruschka, 2010).

Qualitative data revealed gardeners viewed the community growing space as a place to reconnect with their cultural roots. This was reportedly fostered in large part by their ability to socially make comparisons between cultivating in Bhutan, Nepal, and the United States. Topics such as which plants to grow, planting and harvesting techniques, pest-control strategies and discussion of the similarities in greenery and access to soil appeared to foster connections not only with each other, but with shared identities as well. Refugees and stateless persons often feel a loss for identities which have either been stripped away or which they have been forced to abandon, creating a sense of hopelessness and helplessness within families (HRW, 2007; IOM, 2008). Previous research indicates an ability to identify with one’s social environment, here other individuals with shared diasporic experiences, is vital to psychological well-being (Schäppi, 2005). Submersion in an environment reminiscent of a time prior to the humiliation, fear, and loss associated with refugee experiences may still then have healing effects, though in nuanced ways which are difficult to capture statistically in a short time.
COMMUNITY GARDENING: A NOVEL INTERVENTION

Findings that gardeners reported significantly higher perceived social support than non-gardeners supported the second proposed hypothesis. In addition to overall higher ratings of social support, gardeners also indicated significantly greater availability of tangible social support (i.e. help with chores or meals if sick). This result was supported by qualitative data gathered individually and during group forums. Participants reported gaining opportunities to develop supportive networks and learn how to access practical services by going to a community space and engaging others through mutually valued activities. Although trending effects on affectionate social support, emotional/informational support, and positive social interactions were not statistically significant for the current sample, all of these areas were supported by reports from participants. Many gardeners framed the garden as a place for sharing not only tangible resources and produce, but also emotional experiences and memories of the homelands from which they are now separated. This finding is particularly important, given the extant literature on the toll social isolation can take on mental health and well-being, particularly among individuals from heavily communal societies (Benson, Sun, Hodge, & Androff, 2011; Keyes, 2000; Pumatiega, Rothe, & Pumariega, 2005; APA, 2010).

It is also important to note that all but one participant indicated living with multiple other family members, therefore indicating participants generally do have access to some type of social contact and support, even if only practical. Qualitative data indicate it may be difficult for individuals to promote their own needs and ask for help accessing resources, which is line with other reports of cultural values of communal harmony (APA, 2010; Dutton, 2011; Pumatiega, Rothe, & Pumariega, 2005). When able family members so often have to sacrifice personal needs to serve the family unit, less self-sufficient family members may be hesitant to advocate for individual needs. This further supports the importance of increased social networks outside the immediate family or home network, through whatever means are affective.
The third hypothesis, that a relationship between community gardening and rated adjustment would be mediated by perceived social support was unsupported in this sample. Although a significant relationship was detected between gardening and adjustment, social support was not a mediator. Gardeners provided this result at the feedback meeting asserted the position that gardening in a community forum does help with practical adjustment, and many individuals discussed increasing social networks that they have been able to rely upon for learning about public benefits, medical care, and transportation networks. Upon further discussion with participants, particularly regarding measures of adjustment, it was suggested the quantitative measure of adjustment contained a ceiling effect for the primarily elderly or disabled sample population. Questions on this measure rate respondents against benchmarks of Western perceptions of functionality (this measure was developed in a refugee services context, but by Western care providers).

Participants shared frustrations at being unable to learn a new language because of their age and lack of formal education. They cited chronic health problems and disabilities as reasons for being unable to attain gainful employment, and thus being unable to support themselves or family members financially. Desires for activities which disabled or elderly individuals could use to support family members and promote individual well-being were widely expressed by participants. Additionally, participants stated although they self-reported positive general ratings of adjustment during the semi-structured interviews, these responses were not genuine, due to a sense of hopelessness in expressing concerns over issues not expected to change.

Generalizability, Limitations, and Future Directions

Participants of this study were from a very specific group, and therefore generalizability to a larger population is inherently limited. Demographic variables and reported experience of difficulties with adjustment and health concerns are comparable to other research conducted
within refugee populations living in the United States (APA, 2010; CORC, 2007; Pumatiega, 2005) and indicate study results may be cautiously generalized to other Bhutanese refugee populations resettled in the USA.

Concerns regarding the cultural validity of measures are always important to note. Although internal consistency of measures used in the current study was demonstrated, and all measures have been previously used with research in refugee populations, qualitative data and observations of the data collection process indicate lack of formal education, language barriers, and difficulty translating certain health and psychosocial concepts may have limited results. Related, it is suspected results on the measure of practical adjustment may have been influenced by a ceiling effect; specifically, elderly participants with physical limitations may have difficulty ever obtaining certain benchmarks, no matter how much psychological support they receive. Although the adjustment measure was taken from a local resettlement agency, a more thorough evaluation with a standardized measure and different standards of adjustment and functionality may be useful in future research. However, these can be difficult to find and vary by cultural population. Additionally, in relation to quantitative analyses, there is potential risk of Type II error. Specifically, mediational testing relied upon correlational analyses which produced no observable significant results. It is possible, however, small to moderate effect sizes may have been missed due to sampling.

In regards to the qualitative information gathered, although research assistants were trained in interview skills and instructed to follow up responses for a robust dataset, there was an extremely small amount of follow up actually carried out. This, in part, is believed to be due to the poor construction of interview questions. Specifically, some questions would have better fit on the demographics data forms (i.e. employment, length of time in the United States, gardening intensity, etc.). Future research would benefit from more open questions regarding general
COMMUNITY GARDENING: A NOVEL INTERVENTION

experiences, followed up by questions to get at more detailed nuances of these experiences. Additionally, during the coding process Initial Domains were highly specified; thus final Categories were similar in topic to Initial Domains. Though this does not appear to have impacted the outcomes, due to such a sparse qualitative set, future use of this coding method will likely provide a more artful depiction of the data with initially broader Domains.

As is expected in community research projects, there was considerable flexibility required on the part of the student researchers and Cultural Ambassadors, as often unpredictable circumstances required frequent rescheduling and adjustments. Multiple times throughout the study either a scheduled participant or a Cultural Ambassador needed to cancel due to personal or family emergencies. Often a death in the community would result in participants being unavailable for a number of days while they attended memorial ceremonies and supported the grieving family. As well, earthquakes in Nepal during the Spring of 2015 pushed back final stages of data collection, as many participants and interpreters had missing family members or joined efforts to raise money for relief support. Future research would be more efficacious if connected with a large service agency. This would enable a stronger research design based on random selection of participants and group assignments, as well as potential for longitudinal follow up.

Comparison of the current sample to normed populations for the majority of measures used here (RHS-15, MOS-SSS, Adapted CAT) was not possible, as comparable information (specifically, means and standard deviations) is not available in the existing literature. However, the mean ratings of both gardening and non-gardening groups were higher than those found in the literature on the PHQ-15. This indicates distress in the form of somatic expressions is important to assess within this population, and should be further explored in future research.
Throughout the entire process of the current study, participants requested that the gathered information be used to not only advocate specifically for open and accessible garden spaces for larger populations, but that information also be used to address other chronic issues they experience as well. Specifically, participants often shared how disappointing their resettlement experiences have been in many ways. Many do not feel like they will ever be able to function at a level to contribute meaningfully to the support of their struggling families, and are eager for opportunities to do so. Participants specifically requested results be used to advocate for any income-generating activities they could engage in from home, to promote their own psychosocial well-being as well as to contribute to overall family stability. It is therefore the intention that results will be shared with local refugee community advocates, as well as larger supportive networks, such as the Office of Refugee Resettlement’s Refugee Agricultural Assistance Program, which funds startup community gardens, often on a moderate scale. Sample participants and the primary student investigator agreed that advocacy should also include refugee populations outside the Bhutanese community, with the hope that when varying communities join together to address shared struggles, diverse cultural nuances and strengths can work together for the benefit of all. This proverbial “all” includes not only refugee groups living in different countries, but also those members of host countries willing to bolster up different human populations when vulnerable, and improve the greater society through diversity of strength.
APPENDIX A

DATA COLLECTION MATERIALS AND REFERRAL RESOURCE
COMMUNITY GARDENING: A NOVEL INTERVENTION

APPENDIX A.1
SEMI-STRUCTURED INTERVIEW – GARDENERS

1. How long have you been living in the US?
2. Did you come directly to Fort Worth?
3. Are you currently living with anyone else? (S)
4. Do you have family or friends in Fort Worth? (S)
5. Did you have family or friends in Fort Worth before you moved here? (S)
6. How well do you think you have adjusted to the US? Why?
7. Do you currently have a job? How did you apply for, and get this job?
8. If you thought a supervisor was treating you differently from a coworker, would you be comfortable approaching a manager about this?
9. Are you able to meet the needs of your family with the paycheck you receive?
10. Do you know how to access public benefits (food stamps, hospital, SSA office, etc)?
11. Are you comfortable taking the city bus?
12. Do you, or does someone in your family own a car?
13. If you have children in school, do you ever communicate with the school? How? How often?
14. Have you completed all of your health screenings?
15. Do you see a doctor regularly?
16. Are you comfortable going to a doctor if you are sick?
17. Are you aware of the recent changes in health care policy?
18. Do you have your I-94 and Social Security card?
19. Do you have a Green Card yet (or Employment Authorization Document - EAD)?
20. (If in the country 5 years) have you applied for citizenship yet? (Why not?)
21. How long have you been cultivating at the Altamesa community garden?
22. How many days a week do you go to the garden? How long do you stay each time?
23. What do you like most about gardening at the Altamesa community garden? Least?
24. What do you talk about while gardening with other people?
25. Do you maintain the plot on your own, or does someone help you?
26. Have you met new people through gardening at Altamesa? Have you gotten to know anyone better?
27. How did you hear about the garden?
28. Have you been able to save any money on produce since gardening at Altamesa?
29. What other benefits have you noticed? (health, exercise, pride in watching things grow, social interactions)
30. Do you also grow things at home? Do you grow more at the garden than at home? How is gardening at home different for you than gardening at Altamesa?
31. What religion do you practice? Does gardening relate to that in any way?
32. Did you cultivate in Nepal or Bhutan?
33. Is there anything you think would be helpful for other people to know about community gardening or moving to the US as a refugee?
COMMUNITY GARDENING: A NOVEL INTERVENTION

APPENDIX A.2
SEMI-STRUCTURED INTERVIEW – NON-GARDENERS

1. How long have you been living in the US?
2. Did you come directly to Fort Worth?
3. Are you currently living with anyone else? (S)
4. Do you have family or friends in Fort Worth? (S)
5. Did you have family or friends in Fort Worth before you moved here? (S)
6. How well do you think you have adjusted to the US? Why?
7. Do you currently have a job? How did you apply for, and get this job?
8. If you thought a supervisor was treating you differently from a coworker, would you be comfortable approaching a manager about this?
9. Are you able to meet the needs of your family with the paycheck you receive?
10. Do you know how to access public benefits (food stamps, hospital, SSA office, etc)?
11. Are you comfortable taking the city bus?
12. Do you, or does someone in your family own a car?
13. If you have children in school, do you ever communicate with the school? How? How often?
14. Have you completed all of your health screenings?
15. Do you see a doctor regularly?
16. Are you comfortable going to a doctor if you are sick?
17. Are you aware of the recent changes in health care policy?
18. Do you have your I-94 and Social Security card?
19. Do you have a Green Card yet (or Employment Authorization Document - EAD)?
20. (If in the country 5 years) have you applied for citizenship yet? (Why not?)
21. Did you cultivate in Nepal or Bhutan?
22. Do you grow any plants at home now?
23. If you had the opportunity, would you participate in a community garden within the city?
24. What religion do you practice?
25. Does cultivating relate to that in any way?
26. Is there anything you think would be helpful for other people to know about moving to the US as a refugee?
COMMUNITY GARDENING: A NOVEL INTERVENTION

APPENDIX A.3
LOCAL RESOURCE REFERRAL SHEET
Referral Resources for Fort Worth Bhutanese Refugees

- Counseling
  - Partners for Refugee Empowerment: Bhutanese community support groups, individual and group counseling, case management, free of charge 4200 S. Freeway, Suite 702. Fort Worth, Texas 76115; Phone 817-207-9200
  - World Relief: Clinical counseling in office or in-home, free of charge, with interpreters. Also offer Refugee Case Management. 817-924-0748.
  - Catholic Charities FW Clinical Counseling: use interpreters (though this is not covered under Medicaid or the other financial program that covers counseling costs of low income clients). counseling_referrals@ccofw.org 817.534.0814
  - Texas Wesleyan University: Glick House Community Counseling Center provides counseling on a sliding scale. Can provide interpretation on request; see clients on weekdays as well as Saturdays. 817-531-4859
  - Center for Survivors of Torture, Dallas: counseling and case management 214-827-2314

- Mental Health Care
  - MHMR of Tarrant County: over-phone interpreters and in-person interpreters (when requested) at the clinic on 1300 Circle Drive. Enrollment process: call the crisis and intake line at 817-335-3022. They will need client DOB, SSN and current address, and will need to speak to the client (will get an interpreter over the phone if necessary). Depending on client need, a case manager can eventually be provided once enrolled in services
  - John Peter Smith Hospital: Psychiatric Emergency Room on 10th floor of main hospital (1500 S Main Street, Fort Worth, TX 76104). They also provide Behavioral Health services, (primarily consisting of psychiatric services, no case management) following at least one admittance to the Psych ER. In person and over-phone interpreters.
  - Millwood hospital (MH, Substance abuse in Arlington): 817-261-3121 X 2279 (hotline) also have a mobile assessment unit and an adolescent unit

- Refugee Case Management
  - Catholic Charities Fort Worth
  - World Relief
  - Refugee Services of Texas

- Bhutanese support groups
  - Organization of Bhutanese Society-DFW: 4500 Cathedral Drive, Suite# 1307 Fort worth Texas 76119 (682)224-0953
  - Partners for Refugee Empowerment

- Women's Shelters
  - Safe Haven of Tarrant County Women's Shelter (24 hour hotline) 877-701-7233
APPENDIX B

DEMOGRAPHICS DATA COLLECTION FORM
## APPENDIX B - DEMOGRAPHICS FORM

Participant #__________________________ Date:____________________

Gender: Male 1 _____ Female 2 _____

Age: ______

Languages: Nepali 1 _____ English 2 _____ Hindi 3 _____ Other 4 ______

Marital Status: Single 1 _____ Married 2 _____ Divorced 3 _____ Separated 4 _____

Widowed 5 _____

Education level: Some school 1 _____ High School Completed 2 _____ Some College 3 _____

College Degree 4 _____ Other 5 _____

Do you currently live in a(n); Apartment 1 _____ House 2 _____

If you live in a house, do you own it? Yes 1 _____ No 2 _____

Number of people in the household: ______

Number of Children: _____ Brothers _____ Sisters _____ Parents _____ Other _____

Relatives _____ Friends _____

Monthly household income: ______

Do people outside of the household provide financial support? Yes 1 _____ No 2 _____

If so, how much? ______

How much money do you spend on groceries per month? ______

How much money do you spend on medical bills or medications per month? ______

How often do you go to the doctor? ______

Do you currently have a case manager with a refugee agency? ______

Do you currently access public benefits? SNAP 1 _____ Medicare/Medicaid 2 _____ Public Housing 3 _____ Other 4 _____

Have you ever been treated for a mental illness? Yes 1 _____ No 2 _____

If yes, when, and for how long? ______

Did you take medication? Yes 1 _____ No 2 _____

Did you receive counseling or therapy? Yes 1 _____ No 2 _____

Do you currently participate in a Bhutanese Community Support Group? Yes 1 _____ No 2 _____

Have you every participated in a community support group, in Fort Worth or anywhere else? Yes 1 _____ No 2 _____
COMMUNITY GARDENING: A NOVEL INTERVENTION

APPENDIX C

UNT IRB FORMS
Supervising Investigator: Dr. Jennifer Callahan  
Student Investigator: Monica Gerber  
Department of Psychology  
University of North Texas

Re: Human Subjects Application No. 14084

Dear Dr. Callahan:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled “Community Gardening: A Novel Intervention for Bhutanese Refugees in the USA.” The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. Federal Policy 45 CFR 46.109(c) stipulates that IRB approval is for one year only, March 27, 2014 to March 26, 2015.

Enclosed is the consent document with stamped IRB approval. Please copy and use this form only for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications. If continuing review is not granted before March 26, 2015, IRB approval of this research expires on that date.

Please contact Shelia Bourns, Research Compliance Analyst, at extension 2018 if you wish to make changes or need additional information.

Sincerely,

[Signature]
Patricia L. Kaminski, Ph.D.
Associate Professor  
Department of Psychology  
Chair, Institutional Review Board

PK/sb
APPENDIX C.2 – UNT IRB CONSENT

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participation in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Community Gardening: A Novel Intervention for Bhutanese Refugees

Principal Investigator: Jennifer Callahan, Ph.D. University of North Texas (UNT) Department of Psychology, Clinical Program

Purpose of the Study: You are being asked to participate in a research study that involves answering questions regarding your experiences gardening, your current health, your adjustment to the United States, and your social support.

Study Procedures: You will be asked to complete two measures of health in Nepali, either in written form or with the assistance of an interpreter if you do not read and write Nepali. You will then be asked various questions about your health and experiences living in the US and gardening, in an interview format with a researcher and Nepali-speaking interpreter. This interview is expected to last about one hour. You may also be asked to attend a focus group session at a later date, lasting one to two hours, in which researchers will ask participants to provide further information regarding their experiences gardening and as Bhutanese refugees living in the United States. Researchers will also be observing garden work days. Total time expected for participant involvement outside of normal gardening activities (if applicable) is three to four hours.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: This study is not expected to be of any direct benefit to you, but it may help others understand how community gardening may be helpful in adapting the transition from Nepal to the United States.

Procedures for Maintaining Confidentiality of Research Records: To protect the participant identities, signed consent forms will be kept separately from the coded data gathered from the measures and semi-structured interview. Video or audio recordings during observations will not be shown to any audience and will only be used by the researchers to document information. All data will be kept secured in a locked area in the research team's office. The confidentiality of your individual information will be maintained in any publications or presentations regarding this study.

Page 1 of 2
APPENDIX C.2 – UNT IRB CONSENT

Questions about the Study: If you have any questions about the study, you may contact Jennifer Callahan at USA telephone number +1-940-369-8229 or by email at Jennifer.callahan@unt.edu.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at USA telephone 940-565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- The researchers have explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw from the study will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You have been told you will receive a copy of this form.

Printed Name of Participant

_________________________________________________________

Signature of Participant

Date

For the Principal Investigator or Designee: I certify that I have reviewed the contents of this form with the parent or guardian signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the parent or guardian understood the explanation.

Signature of Principal Investigator or Designee

Date

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APPENDIX C.3 – UNT IRB RENEWAL

March 31, 2015

Supervising Investigator: Dr. Jenifer Callahan
Student Investigator: Monica Gerber
Department of Psychology
University of North Texas

RE: Human Subjects Application No. 14084 – R15

Dear Dr. Callahan,

The UNT Institutional Review Board has reviewed and approved the extension you requested to your project titled “Community Gardening: A Novel Intervention for Bhutanese Refugees in the USA.” Your extension period is for one year, March 27, 2015 through March 26, 2016. Federal policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only.

Enclosed is the consent document with stamped IRB approval. Please copy and use this form only for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications. If continuing review is not granted before March 26, 2016, IRB approval of this research study expires on that date.

Please contact Shelia Bourns, Research Compliance Analyst, 940-565-3940, if you wish to make changes or need additional information.

Sincerely,

Chad Trulson, Ph.D.
Professor
Department of Criminal Justice
Chair, Institutional Review Board

CT: sb
University of North Texas Institutional Review Board

Informed Consent Form

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**Study Procedures:** You will be asked to complete two measures of health in Nepali, either in written form or with the assistance of an interpreter if you do not read and write Nepali. You will then be asked various questions about your health and experiences living in the US and gardening, in an interview format with a researcher and Nepali-speaking interpreter. This interview is expected to last about one hour. You may also be asked to attend a focus group session at a later date, lasting one to two hours, in which researchers will ask participants to provide further information regarding their experiences gardening and as Bhutanese refugees living in the United States. Researchers will also be observing garden work days. Total time expected for participant involvement outside of normal gardening activities (if applicable) is three to four hours.

**Foreseeable Risks:** No foreseeable risks are involved in this study.

**Benefits to the Subjects or Others:** This study is not expected to be of any direct benefit to you, but it may help others understand how community gardening may be helpful in adapting the transition from Nepal to the United States.

**Procedures for Maintaining Confidentiality of Research Records:** To protect the participant identities, signed consent forms will be kept separately from the coded data gathered from the measures and semi-structured interview. Video or audio recordings during observations will not be shown to any audience and will only be used by the researchers to document information. All data will be kept secured in a locked area in the research team's office. The confidentiality of your individual information will be maintained in any publications or presentations regarding this study.

**Questions about the Study:** If you have any questions about the study, you may contact Jennifer Callahan at USA telephone number +1-940-369-8229 or by email at Jennifer.callahan@unt.edu.

Approved by the UNT IRB
From 3/27/15 To 3/26/16
Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at USA telephone 940-565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- The researchers have explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw from the study will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You have been told you will receive a copy of this form.

Printed Name of Participant

______________________________

Signature of Participant                Date

For the Principal Investigator or Designee: I certify that I have reviewed the contents of this form with the parent or guardian signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the parent or guardian understood the explanation.

Signature of Principal Investigator or Designee                Date

APPROVED BY THE UNT IRB

[Signature]

3/27/14 3/26/14
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