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Exploring Ethnocultural Differences in Distress of Newly Arrived Refugees During Early Resettlement: A Mixed Methods Dissertation

Abstract

This mixed methods dissertation explored potential differences in distress levels between newly arrived refugees from Bhutan/Nepal, Burma, Iraq, Somalia and the Democratic Republic of Congo during the first year of resettlement in Denver, Colorado. Utilizing RHS-15 quantitative outcomes and demographic data collected approximately every 3 months for 1 year, three approaches to propensity score analysis were performed with risk set matching on balancing time-varying covariates across treatment conditions at each time point. Subsequently, a three-way factorial ANOVA was conducted to examine mean differences in distress levels between treatment group, ethnocultural background, and time. In addition, clinical interview data were analyzed through a deductive coding framework to triangulate and contextualize quantitative findings.

At arrival, newly arrived refugees from Iraq reported the highest level of emotional distress followed by refugees from the DRC; whereas refugees from Bhutan/Nepal, Burma and Somalia endorsed lower levels of distress. These differences were statistically significant. In semi-structured clinical interviews, newly arrived refugees with higher distress in early resettlement reported lower monthly incomes, higher unemployment, unstable and uncomfortable housing, greater cultural and English language barriers, chronic health issues/pain and disabilities, and poor access to social support from family and friends. In contrast, newly arrived refugees with lower distress described living in comfortable and safe home environments with family and friends, stronger English skills and cultural knowledge, and greater job prospects or employment.

Findings highlight the need for screening tools to assess factors related to safety and stability in newly arrived refugees, such as access to basic needs, English skills, employment readiness, and social support, as these were found to explain differences in distress levels across the first year of resettlement. Future research should develop screening items that are grounded in culturally-specific expressions of distress, as the present study found ethnocultural background impacted newly arrived refugees' endorsement of distress symptoms. A discussion of study challenges and limitations is also provided in conclusion.

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First Advisor

Antonio Olmos, Ph.D.

Second Advisor

Nicholas Cutforth

Third Advisor

Gwen Mitchell

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EXPLORING ETHNOCULTURAL DIFFERENCES IN DISTRESS LEVELS OF
NEWLY ARRIVED REFUGEES DURING EARLY RESETTLEMENT:
A MIXED METHODS STUDY

A Dissertation

Presented to

The Faculty of the Morgridge College of Education

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Maria M. Vukovich

August 2016

Advisor: Dr. Antonio Olmos

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Author: Maria M. Vukovich

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Chapter 1:

Introduction

In the summer of 2003, I traveled to Sahrawi refugee camps in Western Sahara as a humanitarian volunteer. Four camps, spanning over 266,000 kilometers of desert, are situated in the Tindouf province of Algeria. Despite the fact the land is almost entirely arid, the region has been locked in battle for sovereignty for over forty years (Human Rights Watch, 2008). Due to ongoing political and territorial conflict between the Polisario Front, Morocco and Algeria, the Sahrawi people have been housed in camps (UNHCR, 2014). Although I arrived ready to serve and care for the Sahrawi refugees, I was utterly naïve to how transformational the experience would be for me.

For my three months stay, I was assigned to live in the communal tent of an 11-person family. They immediately welcomed me—a young, white, American female—with unconditional hospitality and kindness. Within the first week, I was put to work alongside the women and children in the family collecting water in dented plastic jerry cans, picking up rations from the local food distribution, and assisting with cooking preparations. Although the tasks were generally mundane and tiring, I quickly grew to admire the fortitude of my host Saharawi family. Over time, the mother and her three

daughters began to recount stories about their lives in the camp. They spoke of loss and hardship, but also of hope for a better life for their children. The women longed for their children to experience a career and the freedom to travel as well as simple daily pleasures, such as going to the market for fresh food.

Nearly fifteen years have passed since my introduction to refugee populations. Still, human rights conditions have continued to deteriorate for the 155,000 refugees living in Western Sahara (UNHCR, 2014). After returning to the United States, I struggled to make sense of what I had witnessed in the Sahrawi camps. I began to volunteer with a local refugee resettlement agency as a way to stay connected with refugees, and my life and worldview were, again, altered. The newly arrived refugees I befriended held the same dreams of a better life through resettlement that I recalled of my Sahrawi friends. Yet, the immense obstacles facing them in their new homeland led to substantial distress, homesickness, and sadness. In several cases, their distress became greater than pre-migration stressors.

These formative experiences have shaped the trajectory of my education, career, and personal convictions. At the core of my research and scholarship, I am motivated by the desire to improve the resettlement process and enable newly arrived refugees to live fulfilled and healthy lives. Armed with goals, I embark on the present study, and dedicate this effort to my friends at the Colorado Refugee Wellness Center. It is because of their willingness to share their time and experiences with me that this project is possible.

Statement of the problem

Prior research has indicated that refugees arrive in the United States with substantial emotional and physical distress (Bhui et al., 2003, Miller & Rasco, 2004; Walsh, 2007). These symptoms of distress place newly arrived refugees at risk for developing mental disorders or may be symptomatic of preexisting mental health illness (Laban, Gernaat, Komproe, Schreuders, & De Jong, 2004; Ai, Peterson, & Ubelhor, 2002). Although the Refugee Act of 1980 established and standardized resettlement requirements in the United States, mental health screening has not been a consistently implemented practice in the majority of refugee resettlement agencies (Savin, Seymour, Nguyen Littleford, Bettridge, & Giese, 2005; Taylor et al., 2013).

A recent national survey conducted with state refugee health coordinators discovered that less than half of U.S. states ask newly arrived refugees about previous war trauma or torture. Of the 25 states that do provide some form of mental health screening, 70.8% rely on informal conversation rather than standardized measures or protocols (Shannon, Im, Becher, Simmelink, Wieling & Fallon, 2012). These gaps are, in part, due to numerous constraints during early resettlement related to time, cost, human resources, accessibility and availability of care, language and cultural barriers, and disparate health seeking behaviors (Savin et al., 2005; Shannon, Vinson, Cook & Lennon, 2015). Shannon et al. (2012) also found mental health screening procedures to be strongly related to the number of refugees resettled in a state and the presence of trauma or torture services available to refugees. Another substantial challenge is that refugees

often present with multi-faceted symptoms, including somatization, outside of the western-defined scope of psychiatric disorders (Hollifield et al., 2002; Shannon, Wieling, Simmelink McCleary & Blecher, 2015).

Beyond these wide-ranging obstacles, there has been a distinct lack of short, culturally appropriate mental health measures that can be used effectively to screen for mental health distress in newly arrived refugees who may need additional assessment and services (Hollifield et al., 2011; Miller & Rasmussen, 2010; Miller & Rasco, 2004; Savin et al, 2005; Shannon et al., 2012). The Refugee Health Screener (RHS-15) is a mental health screener empirically developed to efficiently identify symptoms of distress in newly arrived refugees during resettlement (Hollifield et al., 2013). Thus far, it has been validated on three ethnic groups of resettled refugees: the Iraqi, Bhutanese (Nepali), and Burmese (Karen, Karenni, and Chin). The RHS-15 has now been expanded to include versions in Russian, Somali, Tigriyna, and Spanish languages with Amharic, Farsi, Oromo, and Swahili forthcoming (Hollifield et al., 2013). An analysis of Bayesian classification revealed adequate psychometric properties, including a Cronbach's alpha of .93, sensitivity of .89, and specificity of .83 (Hollifield et al., 2013). Although preliminary validation has demonstrated promising psychometric functioning of the RHS-15, there is a dearth in the literature with respect to understanding the cultural relevance and responsiveness of the screening tool. Additionally, no known research has explored differences in how newly arrived refugees may endorse items on the RHS-15 based on their distinct ethnic and cultural backgrounds (Hollifield et al., 2013).

Nonetheless, due to its brevity, the use of the RHS-15 is likely to increase in both clinical and research applications. This calls for a more rigorous examination of its functioning and usability with a widened scope of newly arrived refugee populations. Further exploration is needed, however, to investigate the use of the RHS-15 over different time periods during the first year of integration; that is, during the initial 30 days of arrival, 3 months resettlement, 6 months resettlement, 9 months resettlement, and 1 year resettlement (Hollifield et al., 2013). The impact of different combinations of mental health services has not been studied with the RHS-15 (e.g., screen only vs. screen and refer for services vs. screen with provision of services and support). This area of study is critical, as it would promote a better understanding of the effectiveness of various mental health and psychosocial support services (MHPSS) with newly arrived refugee populations during the process of integration (Hollifield et al., 2013; Savin et al., 2005).

Although still emergent in its application among newly arrived refugee populations, community-based participatory research (CBPR) has been found to be a promising strategy for examining the cultural and social determinants of refugee health disparities (Israel et al., 2005). The collaborative and inclusive nature of CBPR offers researchers the ability to effectively identify and investigate complex topics from multi-layered perspectives (Guerin, Allotey, Elmi & Baho, 2008). Finally, the CBPR process promotes trust building, community engagement, and empowerment of both individual and collective voices (Johnson, Sagal & Shipp, 2009).

The following CBPR principles guided the present study: 1) recognition of community and resources as an unit of identity, 2) building on existing strengths and resources within the resettlement community, 3) facilitating collaborative partnerships in all phases of the study, 3) integrating knowledge and action for the mutual benefit of all stakeholders, 4) promotion of co-learning and empowering process that attend to sociopolitical inequalities, 5) involving a cyclical and iterative process, 6) addressing distress symptoms through trauma-informed perspectives and cultural idioms of distress, and 7) Findings and recommendations offered in an holistic and utilization-focused manner.

Purpose of the Study

The primary purpose of this CBPR study using a sequential explanatory mixed methods design was to address the paucity of evidence on potential differences in distress symptoms during the first year of resettlement in newly resettled refugees. The present study also examined how and why these potential differences in distress symptoms may vary across newly arrived refugees from five different cultural backgrounds receiving behavioral health services at the Colorado Refugee Wellness Center (CoRWC) in Aurora, Colorado. Finally, the study broadened the application of propensity score analysis utilizing multiple approaches to risk set matching in the field of mental health.

Specifically, the goals of this study were four-fold:

- (1) To examine potential differences in distress symptoms of newly arrived refugees over time in early resettlement.

- (2) To examine potential differences in distress symptoms of newly arrived refugees from five distinct ethnocultural backgrounds, including Burma, Iraq, Bhutan/Nepal, Somalia, and The Democratic Republic of Congo, over time in early resettlement.
- (3) To assess the performance of three approaches to risk set matching in balancing time-varying covariates among treatment groups over four time points during first year of resettlement.
- (4) To facilitate the exploration of possible factors that may contribute to ethnocultural variability in distress levels among newly arrived refugees from five distinct cultural backgrounds across the first year of resettlement.

In the initial quantitative phase of the study, the first purpose examined potential differences in distress levels as well as the impact of time-varying covariates on variability in distress levels during integration. The second qualitative phase served as a means to explore possible factors that may contribute to ethnocultural variability in distress among newly arrived refugees across the first year of resettlement. In depth, semi-structured clinical interviews were conducted by clinical providers and health navigators at CoRWC as well as with each of the five cultural groups of newly arrived refugees in order to gain multiple perspectives in an inclusive and comprehensive manner. Lastly, results from both quantitative and qualitative strands were integrated to compare, contrast, and make sense of parallel and incongruent findings.

Research Questions

Three primary research questions guided the study:

- 1) Are there potential differences in distress symptoms (as measured by RHS-15) of newly arrived refugees across the first year of resettlement?

Hypothesis 1: There will significant differences found in the distress levels of newly arrived refugees over the first year of resettlement.

- 2) If so, are the potential differences in distress symptoms significantly different among the five different ethnocultural groups of newly arrived refugees across the first year of resettlement?

Hypothesis 2: There will be statistically significant differences in distress explained by ethnocultural background of the newly arrived refugees.

- 3) How do the pre arrival livelihoods, post arrival experiences, and current home environment of newly arrived refugees from five distinct ethnocultural backgrounds explain potential differences in distress levels during the first year of resettlement?

The first two research questions were examined through the use of propensity scores analyses with risk set matching with three approaches, including nearest neighbor 1:1, nearest neighbor 1:2, and Mahalanobis distance. Prior to and following the propensity score analyses, a three-way factorial analysis of variance was performed to: 1) examine mean differences between high and low distress levels, ethnocultural background, and time, and 2) investigate the impact of that matching on time-varying covariates at each

time point had on treatment effects revealed in inferential analyses. Lastly, qualitative data was collected through a semi-structured behavioral health interview to explore the third research question regarding how potential factors in refugees' home environment, and pre and post arrival experiences are related to ethnocultural variability in the distress levels of newly arrived refugees from Burma, Iraq, Bhutan/Nepal, Somalia, and the Democratic Republic of Congo. The qualitative findings were triangulated with the quantitative results at the point of interface, enhancing credibility and trustworthiness to the overall findings of the study.

Definitions of terms

Balanced Risk Set Matching: A recently developed approach to propensity score analysis in which an individual receives the treatment or intervention at time t , and that patient is matched to another patient with a similar history of symptoms up to time t who has not received the treatment up to time t . Marginal distributions of symptoms are forced to be balanced in the matched treated and untreated groups. Among all balanced matching pairs, a balancing score is selected to minimize the multivariate pretreatment covariate distance within matched pairs (Li, Propert & Rosenbaum, 2001).

Community Based Participatory Research: An action-based and collaborative applied research framework by which community members actively participate equitably in the full continuum of the study, from conception to dissemination of findings, with the over-arching objective of instigating change in systems, programs, and policy (Israel, Eng, Schulz & Parker, 2005).

Colorado Refugee Wellness Center: The Colorado Refugee Wellness Center (CoRWC) serves as a central location for health navigation, integrated care, and behavioral health services for newly arrived refugees and their families. CoRWC partners with MCPN, Department of Medicine and University of Colorado Hospital at Anschutz Medical Campus, Asian Pacific Development Center, University of Denver's International Disaster Psychology program, and local resettlement agencies to support integration for newly arrived refugees.

Health navigators: Act as cultural brokers and offer critical support during the resettlement process through the provision of language, cultural, transportation, and case management services.

Integration: Integration is a dynamic, two-way process that occurs during the initial year of resettlement. In order to foster successful integration, newly arrived refugees and host communities must build effective strategies for communication, develop mechanisms to function together and enrich one another, expand employment options, create viable economic opportunities, and demonstrate mutual respect and understanding among persons of different cultural backgrounds (Church World Service, 2010; Ager & Strang, 2008; Office of Refugee Resettlement, 2014).

Propensity Scores Analysis: A statistical analysis technique developed for estimating treatment effects with non-experimental or observational data. This approach provides researchers and evaluators with the ability to assess true treatment effects without any interventions implemented through randomized assignments rules by attempting to mimic randomized assignment to treatment and control group by selecting

the comparison group based on units that have similar propensities to units in the treatment group (Austin, 2010; Guo & Fraser, 2015).

Refugees: According to the United Nations 1951 Convention on the statuses of refugees, refugees are persons who have crossed an international boundary as a consequence of well-founded fear of persecution on the basis of race, religion, nationality, social group membership, or political opinion (UNHCR, 2008). These five criteria are known as the nexus. Of the three durable solutions available for refugees (repatriation, local integration into the country of first asylum, and resettlement in third countries), the first two options are favored over resettlement by the international community due to resource intensive nature of third country resettlement (UNHCR, 2008).

1980 Refugee Act: The Refugee Act of 1980 established The Federal Refugee Resettlement Program to implement the successful resettlement of newly arrived refugees. Within this statute, focused assistance is provided to support refugees in achieving economic stability as efficiently as possible after arrival in the United States (Office of Refugee Resettlement, 2014). This act also standardized the resettlement process for every refugee who is admitted into the United States.

Resettlement as a global phenomenon: Resettlement is the process by which legal and physical protection is granted to persons who obtain refugee status on the basis of nexus. The UNHCR assign resettlement to a third country for refugees when it is the

only safe and durable solution available. Although over 11 million refugees are of present concern to the UNHCR, less than 1% of these persons receive resettlement assignments (UNHCR, 2014). The UNHCR recognizes and supports each State's right to approach resettlement in a manner appropriate to its particular context, however the UNHCR also advocates for the legal and socio-economic needs of newly arrived refugees to be met in a manner that ensures a viable solution can be reached.

Resettlement in the United States: In 2014, 69,987 refugees were resettled in the United States (ORR, 2014). For 2015, the Presidential Determination allows for 70,000 refugees to be admitted into the country (ORR, 2015). Prior to resettlement, refugees are complete official paperwork and health screenings. The process of resettlement includes but is not limited to the provision of: housing, transportation, cultural orientation, language training, employment and life skills training, and health services. The measure of effective resettlement is not only how many refugees in need of resettlement have access to this third durable solution each year, but also how well they are received and supported in the process of becoming engaged participants in their new communities (ORR, 2014).

Resettlement in Colorado: A total of 2,287 newly arrived refugees were resettled in Colorado during 2014 (Colorado Refugee Services Program, 2014). During 2014, the largest newly arrived refugee populations resettled in Colorado originated from Iraq (516), Burma (445), Somalia (400), Bhutan (243), Democratic Republic of Congo (176), and Afghanistan (124). The vast majority of newly arrived refugees are resettled

within the Denver Metro area in Arapahoe and Adams counties (Colorado Refugee Services Program, 2015).

Significance of the Study

Previous reviews of the extant literature have failed to uncover meaningful longitudinal trends in distress symptomology during integration (Hollifield et al., 2013; Slobodin & de Jong, 2015). Furthermore, few research efforts have explored potential ethnocultural variability in the presentation of distress among newly arrived refugees from Burma, Iraq, Bhutan/Nepal, Somalia and the Democratic Republic of Congo. The present study contributed to the under-developed body of literature on patterns of distress over time as well as added to the emergent discussion on ethnocultural variation in expressions of distress among newly arrived refugee populations.

Also, the qualitative findings augmented the current understanding of how distress levels during the first year of resettlement potentially differ among newly arrived refugees from distinct cultural backgrounds. This study provided the first known application of propensity scores analysis using balanced risk set matching technique with refugee populations in the field of mental health. Given the well-documented disparities in sampling methods utilized to study refugee populations, propensity scores analysis with balanced risk matching has the potential to offer a meaningful solution for examining real treatment effects in mental health and psychosocial interventions in the absence of random assignment (Slobodin & de Jong, 2015; Shannon et al., 2015; Boch, 2009).

Delimitations

The present study was confined to exploring potential changes in distress levels of newly arrived refugees who arrived in United States within the past year (2014-2015), and received a mental health screening administered by the Colorado Refugee Wellness Center in Aurora, Colorado. There are additional behavioral and social supports offered to newly arrived refugees in the Denver Metro Area by local resettlement agencies, which the study did not account for due to finite human and financial resources available during the project. Although examining emotional distress outcomes over five time points during early resettlement increased power of the results presented in this study, the overall depth and breadth of findings were limited by the small sample sizes in each of the distinct ethnocultural groups.

Follow up RHS-15 assessments were exclusively conducted with newly arrived refugees who screened positive for emotional distress at baseline. This challenge in the research design was due to limited resources and programmatic decisions made prior to the current study. Thus, findings presented in this study do not extend to newly arrived refugees who did not meet the cut-off for high emotional distress at baseline screening, as subsequent differences in distress were not monitored in this population at CoRWC. In addition, this design may have introduced selection bias as it precluded the exploration of differences in distress of newly arrived refugees who presented with more avoidant or dissociative symptoms at arrival.

At this time, data on specific treatment modalities is not being collected due to lack of capacity and resources at the CoRWC. New protocols are being put in place to identify such outcomes with the long-term goal of measuring the effectiveness of different treatment approaches on distress levels of newly arrived refugees screened by the CoRWC. In the future, large-scale studies are necessary to identify explanatory factors for systemic changes in the distress levels of newly arrived refugee populations across early resettlement. In addition, minimal research has investigated the shape of systematic changes in emotional distress over time in newly arrived refugees and what factors may predict successful or unsuccessful resettlement trajectories. Both directions are critically needed as the magnitude of refugees resettled worldwide continues to rise.

Chapter 2:

Literature Review

The following review is divided into six major sections. In the first section, the resettlement process and underlying theory of integration are defined and discussed in the first section. The current body of research on refugee mental health is explored as it relates to the present study second in the second section. The third section provides history and context on the political conflicts endured by newly arrived refugees from five distinct ethnic backgrounds included in this study (i.e. Burma, Iraq, Bhutanese/Nepal, Somalia and the Democratic Republic of Congo). In addition, commentary on idioms of distress specific to each ethnocultural group included in the project is included in the third section. The principles of Community Based Participatory Research, and its application among refugee populations are discussed in the fourth major section. An overview of the primary quantitative data analyses techniques employed in this study, propensity scores analysis, balanced risk set matching approach, and three-way factorial analysis of variance design are detailed in the fifth section. Finally, qualitative data collection methods and analysis techniques are discussed in the last section of the chapter.

Refugee Resettlement

Complexity of the Resettlement Process.

By nature, resettlement is an ever-changing process for newly arrived refugees. Substantial and nearly constant challenges are presented by inadequate housing accommodations, low financial resources, minimal language skills, limited or unsatisfactory employment or educational opportunities, among others. These substantial challenges are exacerbated by the elevated risk of mental health issues facing newly arrived refugees in the resettlement stage as a consequence of the extensive exposure to torture, trauma, and loss that many have experienced prior to arriving in the United States (Shannon et al., 2015; Murray, Davidson & Schweitzer, 2010; Craig, Jujua & Warfa, 2009). Nonetheless, many newly arrived refugees demonstrate extraordinary resilience in the face of ongoing psychosocial difficulties, including grief, loss, and adjustment (Murray, Davidson & Schweitzer, 2010).

Adverse outcomes in resettlement have been linked with changes in social roles (Colic-Peisker & Walker, 2003), unemployment and financial difficulties (Beiser & Hou, 2001), chronic physical and dental health conditions (Ackerman, 1997; Carlsson et al., 2006; Morris et al., 2009), reproductive health and family planning (Beine et al., 1995; Herrel et al., 2004; Johnson et al., 2014; Morris et al., 2009), mental health (Carlsson, Blackburn & Barker, 2011; Miller et al., 2002; Morris et al., 2009; Steel et al., 2009), and social isolation (Lie, 2002; Miller et al., 2002; Mollica et al., 2001). Additionally, a recent meta analysis discovered that individuals who had higher levels of education and

experienced greater decreases in socioeconomic status following resettlement had greater difficulties, including higher distress during the resettlement process (Porter & Haslam, 2005).

Indicators of Integration Theory.

A growing body of literature has identified key indicators of early resettlement. Silove et al. (1997) discovered changes and challenges throughout resettlement by monitoring the status of five core adaptive systems, including safety, attachment, justice, identity role, and existential meaning. Emergent research has indicated length of time resettled may be a determining factor in the severity of symptom presentation (Silcove, 1997; Mollica et al., 2001). That is, the extent to which resettled refugees successfully manage the everyday difficulties and levels of psychological and emotional distress fluctuates routinely based on the given needs related to the phase of resettlement they are in (Miller & Rasmussen, 2010). Ager & Strang (2004) developed a refugee integration framework in response to the sporadic needs that arise during resettlement and the lack of a theoretical framework by which to research and evaluate the process of integration.

Ager & Strang (2004) “Indicators of Integration” conceptual framework consists of following structure: 1) foundation, 2) facilitators, 3) social connections, and 4) means and markers. Fundamentally, rights and citizenship build the foundation by which newly arrived refugees can integrate into the resettlement community. That is, the expectations and obligations of citizenship and nationhood are represented within citizenship and nationhood. Language and cultural knowledge along with safety and stability act as key

facilitators during integration. Social connections are constructed of social bridges, social bonds and social links within the resettlement community, and emphasize the critical important of relationships during the integration process. Finally, employment, housing, education and health serve as the primary markers to not only demonstrate progress towards integration but also to support achievement in other areas (Ager & Strang, 2008; Ager & Strang, 2004).

The framework is not intended to be a hierarchy, but rather a “system of pathways” by which newly arrived refugees may progress throughout the process of integration (Ager & Strang, 2004). As such, one domain is not inherently more essential than another, and there is no correct sequence for newly arrived refugees to interact with each domain. For example, securing employment is not necessarily a prerequisite for strengthening stronger bonds within the community. Overall, Ager & Strang’s (2004) Indicators of Integration framework provides a structure by which to conceptualize the key components and intersecting factors that may be relevant to promoting successful integration of newly arrived refugees into their new communities.

Refugee Mental Health

Invisible Barriers and Stigma.

Mental health is a fundamental component to human health. Mental health enables people to realize their potential, cope with the normal stresses of life, work productively, and contribute to their communities. Depression is now the single largest

cause of disability in developed countries. By 2020, mental health is projected to be the largest burden of disease worldwide (World Health Organization, 2012).

Despite its important role in society, mental health has remained a largely invisible and unspoken burden. Depression, anxiety, and stress are the most prevalent sources of mental health issues, and are routinely brought on by the several root causes. Foremost, a perceived personal or familiar risk is associated with a heightened sadness, fear and stress. Restricted mobility is also linked to distress, whether it is losing the ability to leave one's own residence or if it is poor lack of personal or public transportation outside of neighborhood. Additionally, limited resources, particularly deficiencies in basic needs and health services are related to greater instances of depression, anxiety and stress. What is more, limited access to information or education, such as how to purchase groceries or search for employment, has been found to contribute to increased mental distress. Finally, events or circumstances that lead to a disruption in cultural or religious practices often trigger depression and exacerbate anxiety and stress levels (World Health Organization, 2012).

During the process of resettlement, refugees face both changes and challenges in every aspect of their lives (Shannon et al., 2015). Difficult circumstances in the lives of refugees are confounded by the experiences of forced migration and persecution in their country of origin as well as new encounters of social exclusion and discrimination in their new home (Murray, Davidson & Schweitzer, 2010). Everyday life activities present personal risks to refugees who arrive in the United States unfamiliar with how to access

services or resources to meet basic needs, including food, shelter, health, education, and employment. Large families are often confined to small one-bedroom apartments without the ability or means to communicate with neighbors, utilize public transportation, and obtain employment (CRSP, Personal communication, November 3, 2014). These obstacles contribute to heightened distress and maladaptive behaviors in newly arrived refugees.

Prevalence of Distress Symptoms.

The presence of elevated risk of psychological and somatic symptoms in newly arrived refugees during the resettlement phase has been well established in the field (Fazel, Wheeler & Danesh, 2005; Porter & Haslam, 2005). Depending on the political context, between 5% and 35% of refugees endure torture while countless more survive war trauma (Baker, 1992). Beyond physical scars, war trauma and torture leave lasting invisible effects on mental health. In a recent meta analysis of 181 surveys and a collective sample of over 80,000 refugees, Steel et al. (2009) found prevalence rates of 30% for posttraumatic stress disorder and major depressive disorders in refugees who have experienced political torture and trauma. After correcting for methodological deficits such as small sample size and non-randomized assignment, the weighted prevalence rates were adjusted to 13% to 25% (Steel et al., 2009). At large, torture experiences and cumulative trauma exposure were found to be the strongest predictors of PTSD and depression (Steel et al., 2009).

Recent studies have challenged the appropriateness of pre-existing mental health constructs, which have traditionally defined by Western concepts and measures (Hinton & Lewis-Fernandez; Miller, 2009; Nichter, 2010). This debate is particularly germane due to the vast diversity of refugee populations. The social, environmental and political impacts of trauma have begun to gain recognition among scholars and researchers alike (Shannon et al., 2015). Such consequences of war and conflict have been shown to produce distinct and culture-bound idioms of distress in refugee populations (de Jong & Reis, 2010; Hinton & Lewis-Fernandez, 2010; Miller, 2009).

Extant research has identified potential differences in the severity and type of mental health symptoms evident in newly arrived refugees (Bhugra & Becker, 2005; de Jong & Reis, 2010; Hinton & Lewis-Fernandez & Pollack, 2009; Nichter, 2010; Shannon et al., 2015). Moreover, Kohrt et al. (2014) recently conducted a large meta analysis on 45 studies related to cultural concepts of distress. In this study, the research team uncovered studies that had explored cultural idioms of depression (20), anxiety, (38), PTSD (9), panic (9), generalized psychological distress (9), and somatic disorders (7) (Kohrt et al., 2014). Their conclusions were that high quality, epidemiological studies of cultural concepts of distress are urgently needed to improve detection of mental health distress, to identify and assess groups at risk, and to evaluate culturally-attuned intervention outcomes.

To date, cultural idioms of distress and psychological disorders are characterized by research studies lacking in rigor due to few explanatory models, use of non-validated

assessment tools, and gaps in reporting methods and design control (Kohrt et al., 2014). Further, the relationship between different presentations and endorsement of distress based on ethnocultural understanding and meaning has remained unaddressed in the literature.

Thus far, variation in distress symptoms of newly arrived refugees during the resettlement process has been linked to duration of resettlement, similarity of culture of origin and culture of resettlement, language skills, social support systems, acceptance by the new community, and employment opportunities (Bhugra & Becker, 2005; Walsh, 2007). Minimal studies, however, have explored the longitudinal changes in distress levels across newly arrived refugees from multiple, distinct ethnocultural backgrounds as well as how related resettlement factors may mitigate these potential differences (Shannon et al., 2015; Schibel, Fazel, Robb & Garner, 2002).

The complex issues surrounding refugee resettlement present an appreciable challenge for all levels of care providers (Shannon et al., 2015). In specific, language barriers, cultural differences in symptom presentation, and clinical severity create obstacles in understanding and treating the symptoms and ailments of newly arrived refugees (CRSP, Personal Communication, November 3, 2014). Further, mental health professionals working with newly arrived refugees are facing multiple environmental setbacks in providing appropriate care for this population (Shannon et al., 2015). Instability and uncertainty of housing accommodations threaten the efficacy of mental health treatments, as refugee clients may be hard to locate for therapy sessions on a

regular basis (CRSP, Personal Communication, September 17, 2014). Previous research has also demonstrated newly arrived refugees are at high risk for drop out due to language or cultural incompatibility between clinical provider and client, thus resulting in difficulty communicating clinical expectations or dynamics within sessions (Bhatia & Wallace, 2007; Van Loon, Van Schaik, Dekker & Beekman, 2011). For these reasons, it is critical that mental health distress be assessed in early resettlement within the lens of ongoing psychosocial stressors related to pre-arrival experiences of violence, trauma and chronic stress, and post arrival needs and circumstances.

Overall, mental health symptoms in resettlement appear to have a curvilinear pattern in which symptoms increase during the initial stages of resettlement then gradually decline over time (Beiser, 1988; Tran, Manalo, & Nguyen, 2007). Moreover, past research has indicated that refugees who have endured sustained high levels of trauma have an elevated risk of developing mental disorders after several years of resettlement (Steel, Silove, Phan, & Bauman, 2002).

Cultural idioms of distress.

The construct of trauma has originated from and been comprehended through a culturally-specific context bound by political, social, economic, religious, and interpersonal factors (Kirmayer, 1989). An idiom of distress was first defined as “an adaptive response or attempt to resolve a pathological situation in a meaningful way associated with cultural norms and values” (Nichter, 1981). Past research has suggested that idioms of distress may be markers or expressions of psychopathological dimensions

(e.g. depression, anxiety, dissociation) or specific mental disorders, such as adjustment disorder, generalized anxiety disorder, posttraumatic stress disorder (Hinton & Lewis-Fernandez, 2010). Moreover, an idiom of distress has been found to be a strong predictor of generalized life distress in an individual (Hinton & Lewis-Fernandez, 2010). In particular, idioms of distress play an instrumental role in identifying distress due to the salience of worry, trauma, and help-seeking behaviors (Hinton & Lewis-Fernandez, 2010).

Although emergent, qualitative literature has begun to identify cultural variations in mental health constructs, and more specifically, idioms of distress among different refugee populations (Hinton & Fernandez, 2009; Korht et al., 2014; Nichter, 2010; Rasmussen et al., 2014). Miller (2009) conducted qualitative interviews with Afghan refugees to develop local understandings of mental illness and distress, and documented the concept of “*fishar*”, which represented an internal state of emotional agitation or low energy. Carroll (2004) discovered multiple idioms of distress in a small sample of Somali refugees as a consequence of exposure to war trauma. In specific, Somali refugees reported “*murug*” (sadness or suffering), “*waali*” (craziness due to severe trauma), and “*gini*” (craziness due to spirit possession).

Additionally, emergent research with Afghan refugees has identified that certain conceptualizations of the mental health distress may not be captured by screening tools (Rasmussen et al., 2014). In specific, available screening tools did not account for culturally-salient concepts of aggression and “*jigar khun.*” This was found to be

particularly problematic for females, which underscored the need for valid mental health assessments that account for gender-differentiated ways of expressing distress symptoms (Rasmussen et al., 2014). The problem at hand, therefore, is that existing mental health screening tools employed by practitioners to assess for emotional distress upon arrival (e.g. the RHS-15) are not inclusive to culturally-specific or gender-specific manifestations of mental health distress of newly arrived refugees.

In a study of traumatic experiences and mental health outcomes in Karenni refugees living on the Thai border, Lopez-Cardozo et al. (2004) found that a high prevalence of reported depression and anxiety outcomes were physically expressed through psychosomatic symptoms, including chronic body aches, stomach discomfort, and heart pain. Idioms of distress in Nepali refugees living in Bhutan were explored by Van Ommeran et al. (2002) and Kohrt & Hruschka (2010), and later used in a recent examination of family perceptions on causes of suicide in Bhutanese refugees living in the United States (Ao et al., 2012).

Most currently, Shannon et al. (2015) explored common and cultural grounded conceptions of mental health effects from political conflict through the voices of newly arrived Karen, Bhutanese, Oromo, and Somali refugees living in the United States. Several important themes surfaced, which included thinking too much, cognitive, behavioral, emotional, and physical effects, fear, sadness, anger, pain, burning emotionally, shame, guilt, and hopelessness (Shannon et al., 2015). Although these thematic categories emerged consistently across all four ethnic groups, the specific ways

in which distress symptoms were exhibited and conceptualized among the refugee groups varied considerably.

Somatic Symptoms in Refugees.

Due to the considerable trauma faced by refugee populations, somatization is an important factor in the origin of unexplained physical symptoms (Rohloff, Knipscheer & Kleber, 2014). Physical symptoms may present in the form of headaches, stomachaches, pain in feet, hands, and limbs, dizziness and weakness (Shannon, Vinson, Cook & Lennon, 2015). A recent systematic review of the prevalence of somatization among refugees revealed several interesting correlations (Rohloff, Knipscheer & Kleber, 2014). Greater somatization was associated with depressive symptoms, whereas lesser physical complaints were affiliated with higher levels of education. Further, increased somatization was found to be associated with refugees of comparable psychopathology who had stronger English language skills (Rohloff, Knipscheer & Kleber, 2014). It was unclear if higher levels of English language encouraged refugees to express physical concerns, however this would be an interesting idea for future inquiry.

Somatic pain is often linked to traumatic stress, whether due to ongoing experiences of torture or trauma or lingering symptoms from prior torture or trauma (Shannon, Vinson, Cook & Lennon, 2015). Kirmayer and Young (1998) developed an integrative, culturally-informed model of somatization, in which they posit different physiological, psychological, sociocultural, and interpersonal factors contribute to the viscous cycle of symptom amplification. Initially, anxiety related to perceived illness

initiate the process resulting in increased emotional and autonomic arousal. Subsequently, avoidance of activity and sick role behaviors lead to physical deconditioning and sleep disturbance. The individual then begins to interpret physical symptoms through his cultural understanding of sick role behaviors, which leads to reattributions for sensations and distress. In turn, this iterative cycle may result in interpersonal conflicts and emotional arousal (Kirmayer & Young, 1998).

Few studies have been conducted on somatic symptoms of refugee populations who have experienced torture and trauma resulting from political conflict (Rohloff, Knipscheer & Kleber, 2014). In an early exploration of somatization in Southeast Asian resettled refugees, Lin, Carter & Kleinman, (1985) discovered somatic symptoms accounted for 35% of all reported symptoms. Of these, headaches, stomachaches/abdominal pain, and lower back pain were the most prevalent. Bieser (1998) conducted a large-scale study on Southeast Asian refugee populations and found no differences in somatic complaints of resettled refugees as compared to the somatic complaints of native residents in British Columbia. In contrast, a study conducted by Gerritson et al. (2005) found elevated somatic complaints in Afghan, Iraqi, and Somali groups. Somatization was found to be significantly related to older age, pre-migration trauma, ongoing stress from post-migration events, and limited English language proficiency in a sample of 342 Ethiopian refugees living in Canada (Fenta, Hyman, Rourke, Moon & Noh, 2010). Bentley et al. (2011) found an indirect effect of somatic complaints on anxiety and depression in Somali refugees, however there was an effect on posttraumatic stress disorder.

In a recent study of resettled refugees from Burma, Schweitzer, Brough, Vromans & Asic-Kube (2010) reported significantly higher somatization related to post-migration stressors as opposed to pre-migration experiences. Van Ommeren et al. (2002) studied the differences in somatization among tortured and non-tortured Bhutanese refugees in Nepal. Findings indicated significantly higher somatic pain in the tortured sample as opposed to somatic complaints of the non-tortured sample. What is more, over 84% of refugees who had been tortured reported somatic complaints, including nervous, gastrointestinal, respiratory, cardiovascular, musculoskeletal system ailments in addition to overall weakness of the body (Van Ommeren et al. 2002). Finally, Hollifield et al. (2013) examined somatization in Vietnamese and Kurdish refugees and discovered higher levels in individuals with depression and PTSD diagnoses, although all participants reported high levels on the different somatic subscales despite having resettled in the United States, on average, for seven years.

History and Context of Political Trauma

Newly arrived refugees from five distinct ethnocultural backgrounds will be included in this study, including Burmese, Iraqi, Bhutanese, Somali, and Congolese. The populations of interest have endured extensive and violent political struggles, with entire generations growing up in either contexts of internal displacement or in refugee camps outside of their countries of origin. In addition to experiencing war trauma, a substantial portion of refugees have been specifically targeted and tortured on the basis of race, religion, political opinion, nationality or social group (Refugee Act of 1980).



Figure 1. Map of Burma.

Burma.

The country of Burma has endured widespread and severe political and ethnic conflict since the 1980s. Several waves of prodemocracy revolts against the reigning government regime have led to extensive bloodshed and pervasive social unrest throughout Burma (USAID, 2001). Systematic violence has been largely targeted at ethnic minority groups, and has resulted in an influx of internally displaced persons and refugees on the Thailand border (Lanjouw, Bamforth & Mortimor, 2000).

Among the hundreds of minority groups in Burma, there are seven large ethnic minority groups recognized in Burma including the Chin, Kachin, Karenni/Kayah, Karen/Kayin, Mon, Rakhine, and Shan (South, 2012). Each of these seven groups has withstood severe persecution from the military government since the assassination of Aung San in 1947. Armed conflict and obscene human rights violations have long afflicted the country, and resulted in the displacement of millions left to seek shelter in

camps on the Thai-Burma border for the past several decades. In addition, a Muslim ethnic minority, Rohingya, are currently experiencing severe persecution on the basis of ethnic and religious tension in a region that is predominantly Buddhist (Amnesty International, 2014). Exiled to internment camps in the isolated northwest region of Burma, the Rohingya are denied access to critical food aid, medical care, education, and employment. Hundreds of thousands have died as a result of this ethnic cleansing, and it continues to be a socio-politically taboo issue in Burma (Human Rights Watch, 2015).

Within Colorado and the United States at large, the Karen make up the majority of resettled refugees from camps on the Thai border. Nonetheless, a growing number of Chin, Kachin, Karenni, and Rohingya have begun to resettle locally (CRSP, Personal Communication, December 4, 2014). The plight of refugees from Burma has led to severe physical and mental health issues (Lanjouw, Bamforth, & Mortimer, 2000). Much of this population has faced forced labor, frequent relocation, and witnessed the killing of family and friends (Lanjouw, Bamforth, & Mortimer, 2000).

Lopes-Cardozo, Talley, Burton & Crawford (2004) identified elevated levels of depression and anxiety symptoms in Karenni refugees living on the Thai-Burma border. The prevalence of posttraumatic stress, however, was found to be comparable to other populations with a history of violence, persecution and trauma (Lopes-Cardozo et al., 2004). Additionally, Lopes-Cardozo et al. (2004) discovered adverse mental health and social functioning outcomes were associated with refugees who reported low access to food, high exposure to traumatic events, prior mental illness, and disabilities. Due to the

collective culture in Burma, the importance of community-based and group-based services rather than individualized and hospital-based treatments is strongly recommended (Lopes-Cardozo et al., 2004).

Research has recognized the importance of the heart in the expression and understanding of distress among refugees from Burma (Niner, Kokanovic, Cuthbert & Cho, 2014). The heart is symbolically referenced as the center of stress, fear, and worry. Crying, yelling and other perceived negative expressions of emotion are described as a “loose” heart. Often, the desired response will be regaining a “tight” heart in order to maintain control or avoid displaying emotions. The Karen word for “*Satedatkya*” which means a “failing or falling power of the heart.” High rates of physical conditions such as hypertension, heart disease, and high blood pressure, have also been identified in research with Karen refugees. In interviews about the physical and emotional effect of prolonged suffering with Karen resettled refugees in Australia, Niner et al. (2014) observed that many described the experience of too much pressure and stress for long period of time as leading to an “unstable heart.”



Figure 2. Map of Iraq.

Iraq.

The country of Iraq has been plagued with extended political and social unrest since the early 1990s. Several decades of armed conflict has severely weakened national infrastructure and socioeconomic development, particularly in the North and West governorates of Iraq. A recent resurgence of armed conflict waged between the Islamic State of Iraq and the Levant (ISIL) and Iraqi government has resulted in more than 2.4 million internally displaced persons, many of whom do not have access to shelter, basic needs, or secure food and water. Over 1.8 million alone have been forced to abandon their homes, jobs, and communities since January 2014 (OCHA, 2015).

Iraqi refugees tend to differ from other refugee groups entering the United States. Prior to their resettlement, the majority of Iraqi refugees do not live in organized refugee

camps, but instead are dispersed in urban areas within Syria, Turkey, Lebanon, and Jordan. In general, Iraqis have a similar demographic and health profile to many middle-income countries (Jamil, Farrag, Hakim-Larson, Kafaji, Abdulkhaleq & Hammad, 2007). Education is free in Iraq, thus many individuals have advanced degrees and professional training, which is often not recognized or transferable upon arrival in the United States. (CRSP, Personal Communication, October 10, 2014). This group also tends to be older, and suffers more from chronic illnesses like cardiovascular diseases, diabetes, and hypertension as opposed to communicable diseases and acute malnutrition that are more readily seen in newly arrived refugees from camps in Asia or Africa (Jamil et al., 2007; Taylor, Yanni, Pezzi, Guterbock, Rothney, Harton, Montour, Elias & Burke, 2013).

The United States has maintained a strained political relationship with Iraq since its protracted occupation during the Persian Gulf and Iraq wars. Additionally, the terrorist attacks of September 2001 left many Americans with deep-seated fear, which has been exacerbated by the media portrayal of Muslims and individuals of Arab descent as terrorists (Jamil, Nassar-McMillan & Lambert, 2007). The general public often has little knowledge of the fact that many resettled Iraqis fought as allies with the United States.

Research has indicated that resettled refugees hailing from the Middle East as well as Arab Americans immigrants often experience negative reception from host communities and neighbors, ranging from suspicious or hostile attitudes to targeted hate-crimes on the basis of their ethnicity, religion, and cultural background (Jamil, Nassar-McMillan & Lambert, 2007). Past research has indicated many newly arrived Iraqi refugees suffer from cumulative traumas due to multiple re-locations, due to the

compounded effects of the Iran War, Persian Gulf and Iraq Wars (Taylor et al., 2013). The recent waves of sectarian violence driven by ISIL has amplified concerns for newcomers with family and loved ones living in camps or affected areas, and may contribute to elevated emotional distress and somatic symptoms (UNHCR, 2015).



Figure 3. Map of Bhutan and Nepal.

Bhutan/Nepal.

In 1987, discriminatory government practices known as the “One Nation” policy forced over 100,000 Bhutanese refugees to flee the country after an ongoing violent struggle. This widespread displacement resulted in the mass exodus of nearly one sixth of Bhutan’s entire population into eastern Nepal. Acts of violence and torture towards the Bhutanese refugees has been well documented in the camps (Tol et al., 2010). After 20 years of negotiations, over 50,000 Bhutanese refugees have now been resettled into third countries, primarily in United States, Australia, and New Zealand (ORR, 2012).

Humanitarian agencies in Nepali refugee camps as well as resettlement agencies in the United States have identified an elevated prevalence of suicide in Bhutanese refugees. International Organization for Migration (2010) conducted an assessment on the mental health needs and suicide risks factors of Bhutanese refugees living in Nepali

camps. Overall, 67 suicide deaths and 64 suicide attempts were documented in Nepali camps from 2004 to 2010, and found high rates of gender-based violence and pervasive untreated mental health and psychosocial issues.

As a follow-up investigation, Office and Refugee Resettlement (ORR) funded a study on the demographic and psychosocial factors related to suicide deaths among resettled Bhutanese refugees in the United States (Ao et al., 2012). Findings suggested gender differences in the time of arrival to death in resettled Bhutanese refugees. On average, the time from arrival to death for females who committed suicides was 33 days (or 1.1 months). For males, however, this time was 223 days (or 7.4 months). Post migration factors were found to be positively correlated with high levels of suicidal ideation, including language barriers, separation from family in country of origin, low perceived social support, not being a provider for his/her family, and difficulty maintaining cultural or religious practices (Ao et al., 2012).



Figure 4. Map of Somalia.

Somalia.

Somalia has been engaged in a prolonged civil war since the 1980s. The political situation was exacerbated when the central government collapsed in 1991, leading to two-decade long armed conflict between Islamist groups and government military forces. Civilians have been subject to indiscriminate attacks and generalized violence as well as targeted persecution. In total, the ongoing conflict has displaced over 2 million into overcrowded and harsh camp conditions for the past 15 years (Amnesty International, 2013). Ongoing turmoil has been compounded with widespread famine and drought (OCHA, 2014).

Armed conflict has continued between the African Union Mission pro-government forces and the Islamist armed group al-Shabaab in central and southern regions of Somalia. The majority of displaced Somalis are housed in Dabaab, the largest

refugee camp in the world by population across the northern border of Kenya and Somalia (Amnesty International, 2013). Although Dabaab has been in operations for over 20 years, the Kenyan government has recently made routine threats to close the camps, which would result in the massive displacement of over 350,000 refugees from primarily Somalia, but also from Burundi, the Democratic Republic of Congo, Ethiopia, Eritrea, and South Sudan (Amnesty International, 2015).



Figure 5. Map of The Democratic Republic of Congo.

The Democratic Republic of the Congo.

The Democratic Republic of Congo (DRC) is a country overflowing with natural resources, however ongoing civil war stemming from ethnic dissension and systemic corruption has long disrupted socioeconomic development. Since 1997, horrific targeted violence has led to the estimated deaths of 900,000 to 5,400,000 persons. The country has

also faced ongoing famine, drought and prolific disease. As of early 2014, the DRC refugee population ranked as the sixth largest in the world (UNHCR, 2014).

The volatile security situation has disproportionately impacted women and girls. In a population-based assessment of the prevalence of sexual violence (n=998), 40% of females and 23% of males reported experiencing sexual violence, including rape (Johnson, Scott, Rughita, Kisielewski, Asher, Ong & Lawry, 2010). In addition, 42% of the represented adult population met criteria for major depressive disorder and 51% for posttraumatic stress disorder (Johnson et al., 2010). Another recent large controlled psychotherapy trial (n = 405) with Congolese survivors of sexual violence discovered 88% of participants screened positively for depression, anxiety and posttraumatic stress (Bass, Annon, Murray, Kaysen, Griffith, Cetinoglu, Wachter, Murray & Bolton, 2013).

A recent survey study completed with 43 resettlement agencies in the United States providing services to newly arrived Congolese refugees reported a widespread mental health issues, including depression, anxiety, posttraumatic stress, substance abuse, and domestic violence (Fuys & Vines, 2013). The study also identified interpreter needs and refusal of services as two critical obstacles to improving access to mental health services in the US for Congolese refugees (Fuys & Vines, 2013).

Community Based Participatory Research

Principles of CBPR.

Community-based participatory research (CBPR) framework is rooted in nine fundamental principles, all of which foster equitable partnerships and collaboration

within a community setting. First, community is acknowledged as a unit of identity (Balcazar et al., 2004; Israel et al., 2005). Second, the strengths, resources, and assets of the community act as the foundation of the study's design in order to address identified concerns (Balcazar et al., 2004; Suarez-Balcazar, 2004; Israel et al., 2005). Third, a collaborative, equitable partnership is a core component in each phase of the research (Balcazar et al., 2004; Suarez-Balcazar, 2004; Israel et al., 2005). In turn, empowerment and power-sharing is promoted throughout each phase of the research study in a way that acknowledges social inequalities among all partners in the study. CBPR researchers seek to recognize and minimize the existing inequalities between themselves and stakeholders by developing trust and open communication in addition to shared decision-making and resources (Israel et al., 2005).

Fourth, an emphasis is placed on fostering co-learning and capacity building through a reciprocal exchange of ideas, knowledge, skills, and capacity among all partners (Balcazar et al., 2004; Suarez-Balcazar, 2004; Israel et al., 2005). Fifth, CBPR seeks to strike a balance between the generation of knowledge and the mutual benefit of all partners involved in the study (Balcazar et al., 2004; Israel et al., 2005). A commitment to the translation of research findings into action strategies to benefit the community at large is included in this principle (Israel et al., 2005).

Sixth, the local relevance of public health, environmental, and sociopolitical concerns are taken into account in order to apply an ecological perspective of the multifaceted determinants of mental health and wellbeing (Balcazar et al., 2004; Suarez-

Balcazar, 2004; Israel et al., 2005). Seventh, a cyclical and iterative process is utilized to develop and expand systems and partnerships within the community (Balcazar et al., 2004; Suarez-Balcazar, 2004; Israel et al., 2005).

Eighth, findings are disseminated to all levels of partners within the community in the way that is understandable, useful and respectful (Israel et al., 2005). Finally, the ninth principle involved of CBPR is the commitment to sustainability (Balcazar et al., 2004; Suarez-Balcazar, 2004; Israel et al., 2005). That is, CBPR researchers recognize the longevity of the research project at hand, and seek to establish and maintain the trust and communication necessary to successfully carry out the study's endeavors (Israel et al., 2005). Above all, CBPR is intended to unite researchers and communities through a shared concern or issue, and establish trust, share power, foster co-learning, enhance natural strengths and resources, build capacity, and examine and address community-identified needs, health concerns and social issues (Israel et al., 2005).

A recent systematic review examined the application of the Belmont Principles within 57 health-related CBPR studies conducted with underserved or underprivileged community partners in the United States, Canada, and the United Kingdom (Mikesell, Bromley & Khodyakov, 2013). The majority of studies reviewed articulated that CBPR should focus on what is ethical for individual participants but also the community at large. Through their work, Mikesell et al. (2013) identified four major components of ethical CBPR studies, which include the following: 1) community collaboration through mutuality, reciprocity, shared leadership, trust, transparency, and authenticity, 2)

community significance through relevance and initiation, 3) community return through social action orientation, capacity building, and sustainability, and 4) community control through joint ownership and strengths-based focus.

CBPR with Refugees.

Conducting research with refugee populations is often an ideologically, linguistically, and culturally challenging process. It requires researchers to be innovative and resourceful in order to create buy-in, and remain engaged and relevant throughout the entire research process. Thus, it is no surprise that the application of CBPR among refugee populations has grown considerably in the past decade, due to its emphasis on utilizing the existing strengths and resources of a community to facilitate lasting change (Johnson, Ali & Shipp, 2009).

The majority of CBPR studies conducted with refugees have been mixed methods, in order to add cultural context, encourage social connections between refugee groups and host communities, and interpret findings in a meaningful and inclusive manner (Johnson, Ali & Shipp, 2009; Israel et al., 2005). By formalizing the use of newly arrived refugees' skills and strengths in both the research design and the interpretation of collected data, researchers gain a more comprehensive and culturally sensitive understanding of the unique mental health needs of newly arrived refugee communities (Johnson, Ali & Shipp, 2009).

Cultural humility and cultural competence.

An essential component that is particularly relevant to CBPR is the practice of cultural humility as opposed to cultural competence (Tervalon & Murray-Garcia, 1998). Researchers who embrace cultural humility seek to increase awareness and acknowledgment of another's culture and background. This is in contrast to the concept of cultural competence, in which researchers attempt to comprehend and understand another's culture and background. Tervalon & Murray-Garcia (1998) emphasize the importance of cultural humility, as a "static notion of competence" is not possible. That is, researchers cannot master another's culture without fully understanding the background and experiences unique to each distinct culture.

In order to develop and maintain cultural humility, a routine process of self-reflection and self-critique is required of the researcher. This process includes identifying and examining one's own unintentional and intentional patterns of prejudice and classism, addressing existing power imbalances, and establishing and maintaining mutually beneficial partnerships with communities. Achieving cultural humility is reflected in the fundamental principles of CBPR given its emphasis on co-learning. Further, a CBPR researcher is required to relinquish his or her role as the expert in order to recognize the role of community members as full partners in the research process (Tervalon & Murray-Garcia, 1998).

Cultural safety.

Another concept germane to the CBPR approach is cultural sensitivity. The process of cultural safety involves the examination of how relationships and power imbalances affect, and are affected by prejudice (Israel et al, 2001; Israel et al, 2005). When applied well, cultural safety gives power to community members to express whether they feel safe or not. Researchers have a responsibility to cultivate an environment, which enables community members to do so without demeaning or undermining the cultural identity or a particular individual or ethnicity (Israel et al., 2005).

Intrinsic to the idea of cultural safety is the recognition that cultural factors, such as differences in worldview or language, have a major impact on current relationships between professionals and communities. Hence, professionals need to acknowledge and understand that these cultural factors as well as social, economic, political, and historical determinants of health disparities can contribute to the distrust of communities and not feeling safe about collaboration (Israel et al., 2001). To achieve cultural safety, it is essential to establish decision-making structures and procedures in which all partners are empowered to express and critically examine their own realities and the attitudes brought to the issue at hand as well as be open-minded toward the views of others. Thus, partnerships can both anticipate and address conflicts through a process recognized by all partners to be cultural sensitive (Israel et al., 2001; Israel et al., 2005).

Propensity Score Analysis

Foundations of Propensity Score Analysis and Matching.

A primary objective of program evaluation and research is to establish causality. That is, evaluators and researchers aim to examine the cause and effect relationships among a specific intervention or treatment between groups that either received treatment or did not receive treatment (control group). In order to establish causality between two variables, three necessary conditions must be met, including the following: 1) variable A must precede variable B (temporal precedence), 2) there must be a relationship between variable A and variable B (relationship of causal effect), and 3) any alternative explanations for the effect other than the cause must be ruled out (isolation) (Guo & Fraser, 2015; Shadish, Cook & Campbell, 2002).

Further, it is crucial that a counterfactual is created to ensure groups are homogenous prior to examining the effect of treatment or intervention. In other words, it is a potential outcome used for comparison between groups that either received treatment or did not receive treatment. When conceptualizing evaluations and research studies as counterfactuals or as unobserved outcomes for the treatment and control conditions, the assumption of ignorable treatment assignment (ITAA) is introduced. Under the ITAA assumption, assignment to one condition or another condition is independent of the potential outcomes if observable covariates are held constant (Guo & Fraser, 2015).

ITAA is well suited for experimental studies that utilize randomized assignment, however this assumption becomes challenging in quasi-experimental studies and observational studies, due to confounded outcomes that are introduced by a comparison

group. Therefore, a critical step is to determine under different conditions whether independence between the treatment and outcomes is met. If the assumptions of ITAA are unmet, a researcher or evaluator will experience the problem of endogeneity; that is, the presence of unconfoundedness (Guo & Fraser, 2015).

If endogeneity is present in a study, there is a greater risk for selection bias. By and large, selection bias is revealed in experimental and observational studies through sources of overt bias and hidden biases. In both instances, differences are present between the treatment and control groups prior to beginning the study, which in turn impact the outcomes in the study. Selection bias is particularly problematic because it leads to inaccurate estimates of the study outcomes (Guo & Fraser, 2015; Austin, 2009). Consequently, a researcher or evaluator may mistakenly draw conclusions about the effects of the treatment or intervention. Moreover, the presence of selection bias, including endogeneity, reduces internal validity of a study. In order to draw valid conclusions about the causal effects of an independent variable and conclude the independent variables are indeed driving the change observed in a given population, it is critical to identify and control for threats to internal validity (Guo & Fraser, 2015).

Treatment selection is often influenced by participant characteristics in observational or quasi-experimental studies. Potential variables that may influence participants to be referred for services are of particular concern when studying racial, social and cultural minority populations, such as newly arrived refugees (Li, Zaslavsky & Landrum, 2013). Consequently, baseline characteristics of participants who received the

treatment may differ systematically from participants who were assigned to the control. It is critical, therefore, that researchers account for systematic differences in baseline characteristics between treated and untreated participants when estimating the treatment effect on outcomes (Li, Zaslavsky & Landrum, 2013).

A fundamental concern of observational studies is to identify and account for pretreatment differences in the participants (Li, 1999). There are two types of pretreatment differences: observed and unobserved. First, observed pretreatment differences between the treated and control participants are called overt bias. Second, unobserved pretreatment differences between the treated and control units are called hidden bias. Matching has traditionally been used to reduce observed pretreatment differences (Rosenbaum, 2010); whereas, sensitivity analysis has been performed to assess the magnitude to which unobserved pretreatment differences is required to explain the association seen in an observational study (Rosenbaum, 2010). For the purposes of this study, the focus will be to investigate sources of overt bias rather than hidden bias.

Matching is evaluated through two different criteria: distance and balance. If the difference between two match participants is small, then the distance criterion is considered met. In order to balance a matching on x , the treated and control groups must have the same distribution on x . For example, suppose that half of treated participants are female. Thus, matching balanced on gender would require half of the matched participants in the control group to be female. While the treated and control groups have a similar distribution on gender, there may be female units who may have been matched to

male units. That is, who is matched with whom is ignored in the balance criterion. As the dimension of x is increased, it may be more challenging to find well-matched pairs in terms of distance. Nonetheless, balance can still be attained in matching (Li, 1999).

Propensity scores analyses also enables researchers to balance observed differences across groups in order to make descriptive and causal comparisons (Guo & Fraser, 2015; Rosenbaum & Rubin, 1983). The standardized difference can be utilized to compare the means of continuous and categorical variables between treatment conditions (Austin, 2009). The standardized difference for a continuous covariate is expressed as the following:

$$d = \frac{(\bar{x}_{treatment} - \bar{x}_{control})}{\sqrt{\frac{s^2_{treatment} + s^2_{control}}{2}}},$$

$\bar{x}_{treatment}$ and $\bar{x}_{control}$ represent the sample mean of the covariate in treated and untreated subjects; whereas, the $s^2_{treatment}$ and $s^2_{control}$ represent the sample variance of the covariate in treated and untreated subjects. The standardized difference for a categorical covariate is expressed as the following:

$$d = \frac{(\hat{p}_{treatment} - \hat{p}_{control})}{\sqrt{\frac{\hat{p}_{treatment}(1 - \hat{p}_{treatment}) + \hat{p}_{control}(1 - \hat{p}_{control})}{2}}},$$

Here, μ treatment and μ control represent the mean of the categorical variable in treated and untreated individuals. The standardized difference compares the difference in means in units of pooled standard deviation.

As such, the standardized difference offers a framework for comparing the mean of time invariant or time-varying covariates between treatment conditions in a propensity score matched sample (Austin, 2009). Substantial benefits to this approach are that standardized difference is not influenced by sample size and allows for comparison of balance across variables measures in different units. Nonetheless, examination of balance across treated and untreated individuals in the propensity score matched sample should not stop with a comparison of standardized difference in means. Graphical methods, such as back-to-back histograms, should also be taken into account when comparing the distribution of continuous and categorical covariates between treatment groups in the propensity score matched sample (Austin, 2009). Although there is no universally accepted rule of thumb, experts in the field have recommended standardized difference of less than .25 (Rosenbaum & Rubin, 2004; Guo & Fraser, 2015).

Although the application of propensity score analyses is still limited in mental health services research, it has been increasingly utilized to reduce the influence of confounding factors resulting from selection bias. For example, propensity score matching was recently used to examine the effects of physical health events on mental health services usage (Yoon & Bernell, 2013). Foster (2003) utilized propensity score analyses with probability weights to investigate the dose-response relationship between

the volume of therapeutic services received and child mental health treatment outcomes. Additionally, the effect of parent disability on child mental health outcomes has been studied through propensity score analysis difference-in-difference matching technique (Neely-Barnes, Zanskas, Delavga & Evans, 2014).

An important and novel area of study is the application of propensity score analyses to account for differences across ethnic or cultural populations in community health services research (Garrido, Kelley, Paris, Roza, Meier, Morrison & Aldridge, 2014). Individuals in the same cluster may influence each other's treatment assignment or outcomes. Such influences may result in the SUTVA violations, thus introducing cluster-level effects even when there are no unmeasured cluster-level confounders (Lu, 2005). In a recent study of the effect of racial disparities on breast cancer screenings, Li et al. (2014) demonstrated the ability of propensity scores analyses in accounting for confounding differences across multiple ethnic groups (e.g. Asian, African American and Caucasian) to examine the true effect of intervention on adherence to breast cancer screenings.

Balanced Risk Set Matching.

Propensity score analysis with matching has become an increasingly popular technique in the field of economics, policy, and health and social sciences to guard against selection bias, yet the majority of studies have applied bipartite matching methods. Bipartite methods sufficiently provide unbiased estimates of treatment effects for classic two-group designs, that is a treatment group compared with a control group. Risk set matching has been used as a model for case-cohort studies (Prentice, 1986), and

in survey research (Langholz & Goldstein, 1996). Li, Propert & Rosenbaum (2001) were the first known study to develop a risk set matching model for time to treatment rather than time to outcome.

Two types of risk set matching have been developed thus far. The first type, risk set matching with untreated controls, is performed by selecting matched controls from a pool of untreated participants. Thus, participants who received treatment are exclusively matched with participants who have never received treatment (Li, 1999). In the second type, risk set matching with delayed treatment, any participants who received treatment at t_1 can be matched with any participants who have not yet received treatment. Therefore, an earlier treated participant is matched with a participant who received treatment at a later time known as “not yet treated” (Li, 1999).

It is routine for observational studies in the health services field to collect longitudinal data. Over time, however, a participant’s covariates may change. Whether a participant received the treatment is often dependent on the intensity of his or her symptoms as well as the judgment of his or her health providers. Consequently, there is a group of individuals who were treated and a group of individuals not yet treated at each time point. Matching is performed at each time point, and the treatment effect is estimated by taking the average of the treatment effects at all time points. Since Li (1999) formative work to develop the balanced risk set matching, the technique has been applied in three additional contexts. Lu (2005) examined the effect of surgery on interstitial cystitis (IC) among a cohort of women over the duration of 4 years through balanced risk

set matching. Apel, Blokland, Nieuwbeerta & van Schellen (2010) utilized risk set matching to examine the effect of first-time imprisonment on individuals' likelihood of marriage or divorce at specific age-dependent covariates. No known applications of balanced risk set matching were identified in mental health services research to date. This represented a major gap in the literature, and thus offered an important opportunity for the study to contribute to the broader field of mental health. Moreover, risk set matching techniques have not been applied in research studies with refugee populations despite their demonstrated ability to balance and improve estimation of treatment effects in medical and forensic research. Exploring the performance of propensity score analysis utilizing the risk set matching, however, is imperative, as resettled refugees as a whole represent an incredibly diverse population (ORR, 2014; UNHCR, 2012). Based on the context prior to arrival, refugees may widely vary in educational and language skills, social economic status, prior profession or employment, family size or structure, etc. (UNHCR, 2014).

Risk set matching has also been used to estimate the relationship between incident diabetes and limitations to movement (Fishman, 2014). The specific approach was selected to ensure that covariates come before the onset of the event (i.e. diabetes) as opposed to follow it, as the later may introduce the presence of endogeneity (Fishman, 2014). Lastly, the balanced risk set matching strategy has been adapted for use across time-varying covariates (Lu, Grevy, Xu & Beck, 2011). In observational designs, the decision about whether to receive treatment is made sequentially, and it may depend on both time-invariant and time-varying covariates observed up to that time. If time-varying

covariates are related to the outcome they may act as time-varying confounders (Li, 2011). Therefore, a fundamental obstacle in the causal inference of time-varying outcomes is to control for confounding covariates that are both invariant and dependent on time. As the present study examined time varying emotional distress outcomes of newly arrived refugees across the first year of resettlement, this novel approach will be applied.

Interviews.

Although developed in the early 1900s by ethnographers, interviews did not become a widely popular methodology in the social sciences until several decades later when the works of Glaser and Strauss (1967) and Spradley (1979) established interviewing as a distinct scientific approach to research. Subsequently, Creswell (1998), Patton (2002), and Kvale and Brinkmann (2009) have offered structured guidance for utilizing interview methods in their textbooks. Historically, there have been three primary applications of interviews in the field of health and social sciences (Wilkinson, 1998). First, interviews have been used as a supplemental strategy to add meaning and credibility to quantitative methods. In this way, they provide context and richness in addition to experimental findings or the development of a survey (Creswell, 2013; Patton, 2012; Israel et al., 2005; McNamara, 1999).

Second, interviews have been applied as the primary method of inquiry. Typically, interviews as a self-contained technique are exploratory or phenomenological in nature. Specifically within the phenomenological tradition, interviews are utilized to develop a broader understanding of participants ascribe meaning to their own life worlds.

Third, interviews are often utilized in participatory or action research. Scholars have suggested that interviews can be a particularly beneficial strategy for accessing populations who have been underserved or poorly served by traditional research practices. In this way, interviews can serve as an inclusive and empowering space for individuals to share his or her voice regarding the issues at hand (Israel et al., 1998; Israel et al., 2005; Wilkinson, 1998).

As a methodological tool, interviews range from an informal, open structure that allows the researcher to adapt the conversation to the nature and priorities of interviewees to a standardized, closed-ended structure that offers a researcher the ability to collect information with consistency and efficiency. In the present study, the use of secondary data collected through qualitative interviews will serve to enhance credibility and contextualize the quantitative results and to acknowledge the individual voices and perspectives of newly arrived refugees in the interpretation of findings. A central aim of interviews is to explore the ways in which an individual makes sense of his or her own attitudes, experiences and needs. Interviews also provide a platform to discuss how participants' life experiences are shaped by their social, cultural and ethnic backgrounds (Brown, Russell & Shen, 2007; Denham, Caal, Bassett, Benga & Geangu, 2004; Hughes & Dumont, 1993).

Interviews with Refugees.

As discussed previously, the interview methodology has a rich history with minority and vulnerable populations. Therefore, its application in the current study is a natural fit for studying newly arrived refugees. Several mixed methods studies have

utilized interviews effectively with refugee populations. Examples include the following: to explore the health experiences of newly arrived Karen refugees in the Midwest, United States (Power & Pratt, 2012); to develop contextually grounded assessment tools and rapidly identify culturally salient constructs in refugees and internally displaced persons (Miller, 2012); to identify and describe questions of wellbeing and mental health in refugees living in Sri Lanka (Jayawickreme & Goonasekera, 2012); to explore the meaning and daily impact of disaster-related stressors on refugee youths living in Sri Lanka (Miller, Fernando & Berger, 2009).

Qualitative approaches are imperative to understanding how refugees ascribe meaning to the range of cultural and political contexts experienced in pre- and post-migration, including traumatic experiences and stressors. Beyond advancing knowledge and practice, researchers working with refugee populations have the obligation to ensure that knowledge generated from their work is applied to further benefit the livelihoods of refugees and their communities (Jacobson & Landau, 2003). Without the added layers of complexity and richness obtained from qualitative inquiry, the human aspects of refugee experience are often lost (Schweitzer & Steel, 2008). In addition, it is essential to rely on cultural informants in the development of design and procedures in order to maintain cultural sensitivity and effectiveness with newly arrived refugee groups (Power & Pratt, 2012).

Ethical considerations with refugee populations.

Undoubtedly, conducting research among refugee populations is a challenging and evolving process. The ethical complexities that accompany research with vulnerable populations have been well documented, however durable solutions to these obstacles remain largely unaddressed. Block, Warr, Gibbs & Riggs (2012) have published best practice recommendations for research with resettled refugee populations. Namely, research processes should seek to maximize the benefits of involvement for refugee participants while reducing the potential harms; enhancing capacities for refugees to give informed consent; and adapting research to be relevant to the daily occurrences and circumstances of refugees' lives; to enhance meaningful engagement throughout the research processes (Block et al., 2012).

Collaborative and participatory methods are proposed as a potentially appropriate way to address some of the ethical issues that are raised in research involving vulnerable populations (Ellis et al., 2007; MacLean et al., 2009; Pittaway et al., 2010). These methods are directly concentrated on dissipating power differentials between stakeholders and enhancing the autonomy and capacity of participants through equitable practices (Mackenzie, McDowell & Pittaway, 2007). Dona's commentary on participatory research with refugee populations, however, warns against the assumption that such research will automatically lead to an empowering and meaningful experience for participants. Rather, researchers should aim to disseminate findings through advocacy for political or social transformation within host communities and newly resettled refugee

groups alike (Doná, 2007). Moreover, it is essential that research findings be utilized in ways that will be not only valuable, but also promote the autonomy and capacity of the refugees themselves (Block et al., 2012).

Chapter 3

Methods

Design

A sequential explanatory mixed methods design will be used in this study, which is a procedure for collecting, analyzing, and integrating quantitative and qualitative data within a single study (Creswell & Plano Clark, 2011). The primary purposes for applying a mixed methods approach in this study will be triangulation, development, and expansion (Creswell & Plano Clark, 2011). That is, the quantitative results will be used to inform the development of the qualitative protocols as well as purposeful sampling of participants for focus groups. Triangulation will be achieved through the convergence and corroboration of dual methodologies, qualitative and quantitative. Expansion enables breadth and range of inquiry to be extended through the complementary use of both quantitative and qualitative methods.

When used in combination, quantitative and qualitative methods complement each other and offer a more comprehensive analysis (Green, Caracelli & Graham, 1989; Tashakkori & Teddlie, 1998). The qualitative will offer context and an elaboration to offset the quantitative results; whereas, the quantitative will offer precise, measured findings to inform and ground the qualitative findings. Finally, the use of dual methodologies, quantitative and qualitative, will extend the breadth and range of inquiry

in the study. Another strength of the sequential explanatory approach is its ability to account for emergent findings over the course of the study. That is, if inconsistent or surprising quantitative results surface in the initial phase of the study, the qualitative phase can be used to explore and add context and depth to the research team's understanding of the unexpected findings (Creswell & Plano Clark, 2011).

As a first step, the secondary screening data outcomes of emotional distress collected with newly arrived refugees at four time intervals during the first year of resettlement were assigned balancing scores estimated through greedy matching of five time-varying covariates at each time point. The balancing scores, or propensities, were estimated based on the likelihood of an individual having high or low expressions of distress at each time point. That is, high expressions represented the "treated" group, whereas low expressions of distress represented the "untreated" group. The matched outcomes were then analyzed using a three-way factorial analysis of variance to examine potential differences in distress levels between ethnocultural group and time of administration. Subsequently, secondary qualitative interview data were analyzed to explore contextual factors related to home environment, pre and post arrival experiences, and social support that may explain patterns identified in the quantitative results. In addition, the secondary qualitative data collected through structured clinical interviews allowed for the refugees' own perspectives to be taken into account during the integration and interpretation of quantitative and qualitative findings (Creswell & Plano Clark, 2011).

Site

In 2012, the Colorado Refugee Wellness Center (CoRWC) was established through a collaborative partnership between Aurora Mental Health Center (AuMHC), University of Colorado Anschutz Department of Medicine, University of Colorado Hospital, and Metro Community Provider Network (MCPN). CoRWC exists to provide holistic care and support newly arrived refugees in the Denver Metro Area through health navigation, primary care, and behavioral services.

The time-limited, integrated service delivery model at CoRWC is designed to effectively meet the complex health and social needs of a high volume of newly arrived refugees through a culturally sensitive and adaptive approach. Located in East Denver, CoRWC is in close proximity to large resettled refugee communities from Burma, Iraq, Bhutan/Nepal, Somalia, the DRC, Ethiopia, Central African Republic, Cuba, Mexico, and many others. All secondary data utilized in this study have been collected on site through CoRWC licensed psychologists, health navigators, and graduate level interns.

Participants

Data collection using the Refugee Health Screener-15 (RHS-15) began in September 2014. The plan to collect longitudinal RHS-15 outcomes developed out of the Director's interest in tracking the distress levels of newly arrived over the course of the first year of resettlement (that is, integration). In particular, the clinical providers and staff had observed subjectively that emotional distress of refugees seemed to fluctuate at different points in time.

By definition, newly arrived refugees have endured substantial persecution, trauma or torture on account of their race, religion, nationality, political opinion or membership to a particular social group (Refugee Act, 1980). Proof of continued fear of persecution is also a condition that must be met before an individual is granted refugee status in the United States. Sources of emotional distress in newly arrived refugees, therefore, are complex and multi-layered. This study was birthed out of the desire to better identify and understand changes in distress during early resettlement and how changes may vary between refugee groups from distinct ethnic backgrounds resettled in Aurora, Colorado.

Participants in this study will be selected on the basis of: 1) time of arrival to Colorado, 2) membership to one of five ethnocultural backgrounds (Burma, Iraq, Bhutan/Nepal, Somalia, the Democratic Republic of Congo), and 3) over the age of 18 years old. The five distinct ethnocultural groups of newly arrived refugees were selected on the basis of sample size to support adequate power in the quantitative data analyses.

Due to ethnical and cultural considerations, random assignment was not used at the outset of the study. Rather, refugees arriving in Colorado were recruited on a rolling basis for mental health screenings at the CoRWC within 30 days of arrival. If a newly arrived refugee met the standard cutoff for high distress, s/he was recruited to participate in follow up screenings at the following four time intervals:

- Timepoint 1, within 30 days of arrival.
- Timepoint 2, approximately 3 months post arrival.

- Timepoint 3, approximately 6 months post arrival.
- Timepoint 4, approximately 9 months post arrival.
- Timepoint 5, approximately 12 months post arrival.

Procedure

Quantitative Strand: Data Collection

Permission to use the RHS-15 and BHS data as secondary clinical outcomes has been granted by the Colorado Refugee Wellness Center. The current study has been reviewed and approved by the Institutional Review Board at the University of Denver. Prior to participating in screening, each individual received informed consent outlining the purpose of the screening and informing the refugee that her or his participation in the screening was completely voluntary and declining at any time would result in no consequences. Health navigators administered the RHS-15 at each time point at the CoRWC. Each of the navigators serve newly arrived refugees of her or his own ethnocultural background in overcoming post-migration barriers, such as scheduling primary and mental health visits, transportation, language translation and interpretation, and with adjustment-related issues during the resettlement process. Each health navigator has extensive training and knowledge on cultural and historical context as well as the structural needs and resources of resettled refugee communities, thus they are well equipped to build trusting relationships with newly arrived refugees.

Secondary data sources in this study will include the following:

1) Refugee Health Screener-15 (RHS-15) is completed by each newly arrived refugee five times over the course of the first year of resettlement at arrival (September 2014), 3 months (December 2014), 6 months (March 2015), 9 months (June 2015), and 12 months (September 2015).

2) Behavioral Health Screener (BHS) is administered at baseline and each of the four follow up screenings. Demographic data will be extracted from the BHS form and used to provide a description of the study participants regarding monthly income, employment status, household size, family resettled in Denver metro area, family remaining in country of origin or camps, and level of English skills obtained from the BHS. These variables will serve as time-varying covariates in the quantitative data analyses.

Measures

Refugee Health Screener-15.

The RHS-15 is an efficient 15-item screener for emotional distress adapted from the New Mexico Refugee Symptom Checklist, Posttraumatic Stress Symptoms Self-Report, and Hopkins Symptom Checklist (Hollifield et al., 2013). Presently, it has been validated among refugees from Burma, Iraq and Bhutan/Nepal using Bayesian analyses. The measure consists of 4 sections. In the first section, there are 9-items on emotional and somatic symptoms in the past month. The second section includes 4-items on

traumatic stress symptoms in the past month. Both sections use a 5-point Likert rating scale from “not at all” to “extremely.” Above each rating, there is a jar with corresponding levels of fullness to depict how bothersome a symptom may have been to an individual over the past month. The third section has 1-item, which inquires about overall coping in life on a 5-point rating scale from “able to cope with anything that comes your way” to “unable to cope with anything.” Finally, the fourth section is comprised of a distress thermometer.

There is an image of a thermometer rising from 1 to 10, and individuals are asked to answer based on how much distress was experienced in the past week. A selection of “1” reflects that “Things are good”; whereas, the choice of “10” indicates “I feel as bad as I ever have.” A copy of the measure is included in Appendix B. The RHS-15 was been validated using Bayesian analysis with newly arrived refugees from Burma, Bhutan, and Iraq. A cutoff score of ≥ 12 was found to have a strong sensitivity [.81 - .95] and specificity [.86 - .89] for PTSD, anxiety and depression disorders as well as high reliability, cronbach’s alpha of .92 (Hollifield et al., 2013).

Behavioral Health Screener.

The BHS is a brief, semi-structured clinical assessment tool developed by the CoRWC staff to collect additional information on demographics, trauma history, and current psychological functioning including depression, posttraumatic stress, anxiety, mania, psychosis, and substance use. These items were utilized as covariate variables in the quantitative analyses. Beyond this, the BHS inquired about home environment, life

before arrival, life since arrival and social support of newly arrived refugees. The later are semi-structured, open-ended items, which were used as secondary data in the qualitative strand.

Quantitative Data Analyses

Prior to the statistical analysis, univariate and multivariate screening were performed on the data (Tabachnick & Fidell, 2012). This preliminary exploration of the data included descriptive statistics for outcome variable, time varying covariates, missing data, and assumptions, and outliers. A power analysis was performed a priori using G power software to assess the probability of detecting a treatment effect, given a true effect is present (Keppel & Wickens, 2004). For a given power of .80, a total sample size of 134 is needed to detect a medium cohen's d effect size of .30. A detailed flowchart of the procedures in all three phases of the quantitative strand can be found in Appendix A.

Propensity Score Analysis with Balanced Risk Set Matching.

In balanced risk set matching, a treated participant is paired with an untreated participant with approximately equivalent time-dependent covariates at each time interval (Li, Propert & Rosenbaum, 2001). In this study, "treated" participants were newly arrived refugees who met the standard cutoff for high expression of distress. Alternatively, "untreated" participants were newly arrived refugees who did not meet the standardized cutoff, thus classified as low expression of distress. Participants in each treatment group were matched on the time-varying covariates at each time point, including monthly income, employment status, family in Colorado, family in camps/country of origin,

English language skills, and household size. In each pair, an individual who expressed high distress at time t was matched to an individual who expressed low distress level at time t . In this way, refugees were matched across treatment groups on the basis of similar time-varying covariates at each respective time point (Apel, Blokland, Nieuwbeerta & van Schellen, 2010).

A crucial step in the matching process was examining whether the distribution of time-varying covariates was balanced among the treated and untreated conditions (Guo & Fraser, 2015; Rosenbaum, 2010). All balanced risk set matching was performed in R software 3.3.0. Hmisc (Harrell et al., 2015) package was utilized to assess the balance prior to matching through standardized difference tests and histogram graphs. MatchIt (Ho et al., 2011) package was used to create risk set pairs between the treated and control individuals using three matching approaches, nearest-neighbor matching performed 1:1 without replacement, nearest-neighbor matching performed 1:2 without replacement, and Mahalanobis distance matching, at each time point (See Figure 1 below).

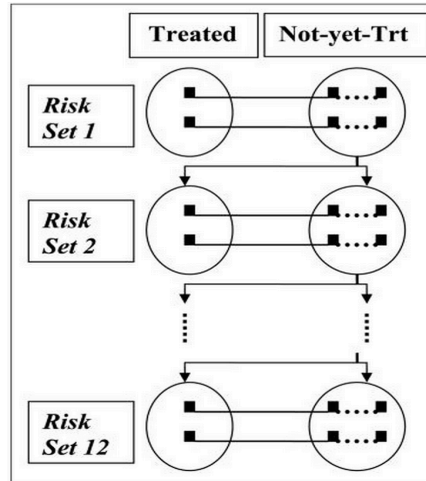


Figure 6. Visual graphic of balanced risk set matching procedure (Li, Propert & Rosenbaum, 2001).

In nearest neighbor matching technique, a treated individual is selected and matched with the untreated individual with a propensity score in the closest proximity. If there are several untreated individuals who are in equal distance to the selected treated individual, then an untreated individual is selected at random. The following formula was used to calculate the distance:

$$C(P_i) = \min_j |P_i - P_j|$$

$C(P_i)$ represents the group of untreated individuals j matched to treated individuals i (on the estimated propensity score). P_i is the estimated propensity score for the treated individuals i , and P_j is the estimated propensity score for the control individuals j . For nearest neighbor matching 1:1 matching approach, one treated individual is matched with one untreated observation. For nearest neighbor 1:2 matching

approach, however, one treated individual is matched with two observations from the control group (Austin 2010; Rosenbaum, 2004).

In Mahalanobis distance matching approach, treated and untreated individuals are ordered randomly, then the distance is calculated using the following formula:

$$D_{ij} = \sqrt{(x_i - y_j)^T S^{-1} (x_i - y_j)}$$

The treated and untreated individuals are matched based on the smallest Mahalanobis distance. The process is repeated until each treated individual is matched with an untreated individual. Any remaining untreated individuals who have not been matched are then removed. Further, if a treated individual was unable to be matched with a similar propensity score, then such individuals were removed due to the fact that reliable casual inferences cannot be made without the use of extrapolation (Austin, 2014; Guo & Fraser, 2015).

All of three matching methods were performed without replacement. That is, once an untreated individual had been matched to a specified treated individual, the untreated individual was no longer available to be matched with a subsequent treated individual (Guo & Fraser, 2015; Rosenbaum, 2004). After matching, the same diagnostics were performed once more to assess the balance on the matched sample. That is, standardized differences were compared pre and post matching as well as an investigation of back-to-back histograms.

Three-way Factorial Design.

Before and after estimating the propensity scores with balanced risk set matching technique, a three-way (2x4x5) factorial design was performed to estimate mean differences between time, treatment group, and ethnocultural background using SPSS 24.0 software (IBM, 2014). The factorial design included treatment group as the within-subjects factor as well as time and ethnocultural background as between-subjects factors. In contrast to the single-factor design, the three-way factorial ANOVA design offered greater efficiency, control, and generality (Keppel & Wickens, 2004). Each time, assumptions were assessed prior to beginning the analysis of variance, including independence, normality, homogeneity of variance (Keppel & Wickens, 2004).

Qualitative Strand: Data Collection

Following the quantitative data collection utilizing the RHS-15, clinical interviews were conducted with newly arrived refugees from each of the five ethnocultural backgrounds. Similar to the data collection in the quantitative phase, the interviews were led by clinical psychologists and health navigators served as cultural informants and translators in the sessions. Each clinical interview was held for approximately 15-30 minutes on site at the CoRWC in Aurora, Colorado. The qualitative sample sizes based on each ethnocultural background are depicted in Table 1 below.

Table 1. Clinical interview sample sizes for each ethnocultural background.

	Bhutan/Nepal	Burma	DRC	Iraq	Somalia
n	22	99	35	40	16

To guide the structure of the clinical interviews, five sections containing twelve open-ended items were constructed and pilot tested with health navigators and CoRWC staff to ensure questions were clear and culturally appropriate (Israel et al., 2005). The interview protocol guide is included in Appendix B. Each interview was documented through the BHS interview protocol as well as the written observations and notes of the clinical psychologist, who consulted with the health navigator after each session.

Interviews were not audio recorded to protect the privacy and confidentiality of clients, as content was clinical in nature and responses included sensitive protected health information. The CoRWC team, including the director, clinical providers, and health navigators, were all invited to review the content and revise if necessary as a form of member checking (Creswell, 2013; Patton, 2014). This step supported trustworthiness of the qualitative data prior to the analyses phase.

Qualitative Data Analyses

Qualitative data analysis utilized an iterative, cyclical process informed by both the researcher and CoRWC staff involved in the study (Israel et al., 2005; Patton, 2014). Once a week, a research intern at CoRWC entered the qualitative data gathered through the clinical interviews into a Microsoft excel spreadsheet. During this process, I met with

the research intern and primary clinical psychologist overseeing the data collection regularly to share overall impressions on central ideas discussed in clinical interviews.

In addition, we routinely consulted on challenges in data collection and data entry to determine the solutions for improving data collection and entry procedures. This took place remotely over Skype, due to the geographic distance between my location and Denver. After data collection was completed in February 2016, the qualitative data was uploaded into NVIVO 10.0 software (QSR International, 2014) for analyses. A pragmatic approach to analyses was employed in the study in order to respond to the primary qualitative question (Greene et al., 2008; Plano Clark, 2010; Tashakkori & Teddlie, 2003). That is, how do the pre and post arrival experiences of newly arrived refugees from five distinct ethnocultural backgrounds explain potential changes in distress levels during the first year of resettlement?

Based on the quantitative results, a deductive coding scheme was developed to analyze the qualitative data. The entire analytic process is described in detail in the fourth chapter. Initially, the research assistant and myself independently identified themes and sub-themes in the transcribed data from each cluster of interviews (Creswell, 2013). Themes will then be categorized within each ethnocultural background. Comparisons of the categorized themes will be made between each of the five ethnocultural backgrounds. Similar findings among the ethnocultural backgrounds will be compiled into overarching themes, and inconsistent findings will be highlighted for further exploration (Creswell,

2013). Themes were discussed with CoRWC staff, and revised themes and interpretations accordingly (Israel et al., 2005; Patton, 2012).

Point of Interface

Although priority was given to the quantitative strand in this sequential explanatory study, the inclusion of qualitative data balanced my understanding of the cultural, contextual and personal factors in early resettlement that may influence differences in the distress levels of newly arrived refugees over time (Israel et al., 2005; Patton, 2014). Thus, it served an invaluable component of the study. Mixing the quantitative and qualitative strands occurred after the quantitative analyses to inform the development of a coding scheme for qualitative data analyses and triangulation of quantitative and qualitative findings. Findings from the quantitative and qualitative strands were then amalgamated, and subsequently compared and contrasted in order to further support findings or uncover conflicting evidence (Creswell & Plano Clark, 2011; Creswell, 2013).

Role of Researcher

Consistent with the principles of CBPR, I collaborated closely with the CORWC director and staff throughout all phases of this project (Israel et al., 2005). As the RHS-15 screening process was nearing completion at the outset of this project, my involvement was most concentrated on the data analyses and interpretation of findings. Maintaining a regular record of my observations and reflections through journaling and memos will be critical parameters during the qualitative strand. During the analysis, it was also essential

to reflect on how my thematic interpretations are influenced by my past work with refugee populations as well as my own personal and political convictions. Moreover, monitoring how my own subjectivities impact my interactions with all levels of stakeholders in the study was necessary. My subjectivities include being a white, upper middle class, well-educated, American female, which is a visible departure from the ethnocultural backgrounds of the participants included in this study. Thus, my reliance on and openness to the insights of the staff, particularly the health navigators, at CoRWC will provide a fuller, richer, more culturally sensitive illustration of the distress encountered by newly arrived refugees during early resettlement (Ahearn, 2000; Shannon et al., 2015).

Ethical Considerations in CBPR methodology

There are profound ethical implications to researching refugees at any stage of the research process (Murray, Davidson & Schweitzer, 2010; Schweitzer & Steel, 2010). Minimizing harm and ensuring that identifying information of participants remains confidential is critical (Banks et al., 2013; Creswell, 2013). Participants' anonymity will be protected through the assignment of a numerical ID to each individual, and keeping quantitative and qualitative data stored on secure servers and password-protected computers.

Likewise, mindfulness is needed to conduct each portion of the study in a way that minimizes the risk of re-exposing newly arrived refugees to harm as they share their stories, experiences and insights (Ahearn, 2000; Hughman, Pittaway & Bartolomei,

2011). Maintaining awareness of how interpretations could potentially place the refugees in danger will be of utmost importance in this study (Ahearn, 2000; Hughman, Pittaway & Bartolomei, 2011). Finally, tensions between my role as researcher, community member, and advocate for improved health services for survivors of war trauma and torture are likely to surface during the CBPR research process. Setting accountability and safe spaces to reflect will be essential to managing these tensions (Banks et al., 2013).

Chapter 4

Results

Part 1: Quantitative Strand

The primary objectives in the quantitative analyses were to examine the potential changes in the distress symptoms of newly arrived refugees over time during approximately the first year of resettlement, and to examine potential changes in distress symptoms of newly arrived refugees from five ethnocultural backgrounds, including Burma, Iraq, Bhutan/Nepal, Somalia, and The Democratic Republic of Congo in early resettlement. A secondary objective was to compare the performance of three matching techniques (e.g. nearest neighbor 1:1, nearest neighbor 1:2, and Mahalanobis distance) on balancing time-varying covariates at each time points, and whether the use of matching led to improved estimates of treatments effects.

The first part of this chapter is comprised of several sections. The first section explored results from a three-way factorial analysis of variance performed prior to propensity score analysis. In the second section, the results of the propensity score analysis utilizing three matching techniques are presented for time point 2 (3 months) through time point 5 (12 months). Within the third section, the results from the three-way ANOVA are presented including assumptions, main effects, simple effects and post hoc

tests. R statistical software version 3.30 was employed to perform risk set matching at each time point. SPSS statistical software version 22.0 (IBM, 2013) was used to clean the data, and perform the 3-way factorial ANOVA and follow up analyses.

Section 1: Three-Way Factorial ANOVA pre matching

A 2x4x5 factorial analysis of variance was performed to examine potential mean differences between two levels of treatment, four levels of time, and five levels of ethnocultural background. As a first step, assumptions of analysis of variance were tested and met for independence and normality. A statistically significant violation of homogeneity of variance was found for ethnocultural background (RCOO); however, the three-way analysis of variance was found to be robust with respect to violations of homogeneity of variance with a balanced design.

Subsequently, interaction terms, main effects, and simple effects were investigated in the three-way factorial ANOVA. The procedures conducted in the three-way analysis of variance are detailed in Figure 2 below.

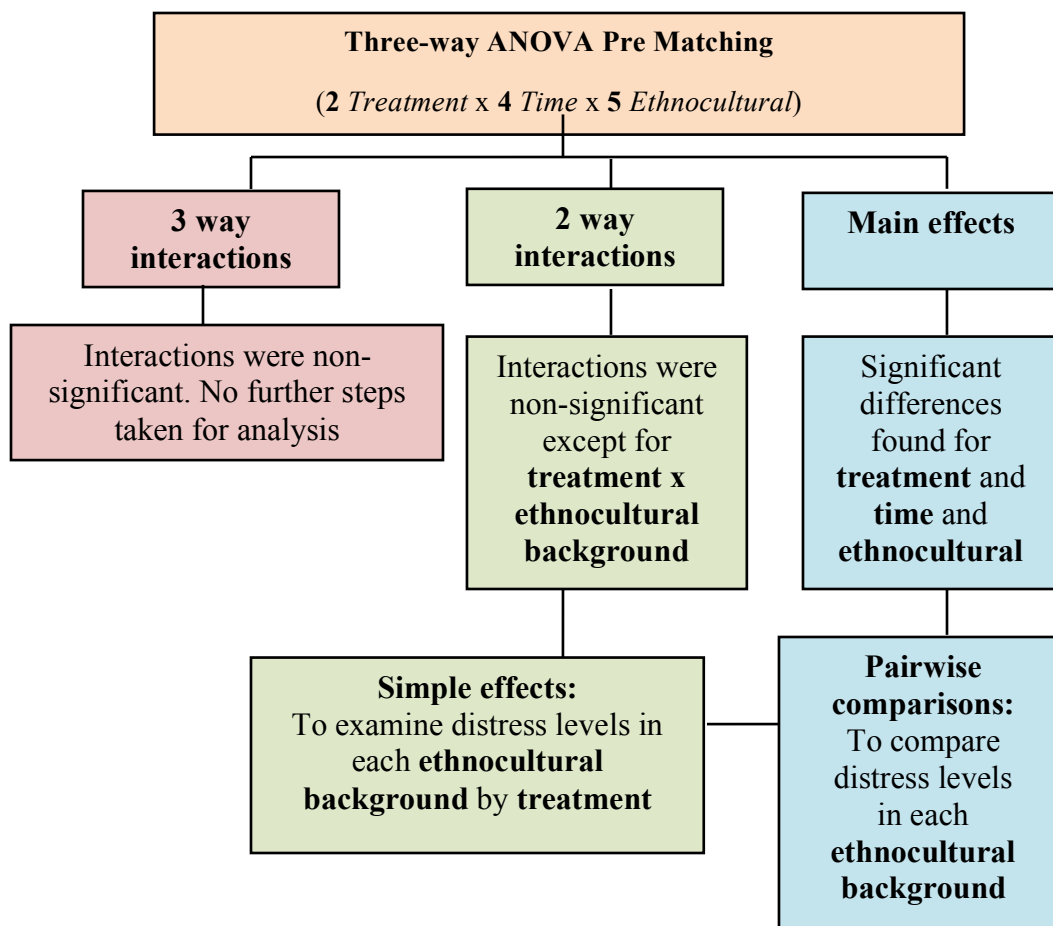


Figure 7. Analysis procedures for three-way factorial ANOVA pre matching

A two-way interaction between treatment group and ethnocultural background was found to be statistically significant, $F(12, 208) = 134.78, p < .001, \eta^2 = .285$ (See Table 3). The interaction between treatment condition and ethnocultural group is displayed in Figure 3.

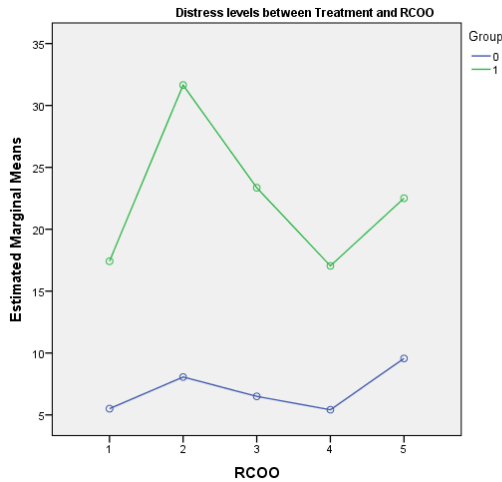


Figure 8. Interaction between treatment group and ethnocultural background, pre matching.

Results of the omnibus analysis indicated a statistically significant main effect was found for treatment, $F(1, 208) = 185.46, p < .001, \eta^2 = .28$ (See Table 2 below), with higher mean distress scores for control group (Mean = 24.91, SD = 4.78) than for treatment group (13.52, SD = 2.86). A statistically significant main effect was also found for time, $F(3, 208) = , p = .043, \eta^2 = .11$ (See Table 3 below), with higher mean distress scores at 3 months (Mean = 17.94, SD = 2.71) than at 9 months (Mean = 13.46, SD = 2.04) or 12 months (Mean = 15.32, SD = 2.18). The average distress scores at 6 months (Mean = 19.98, SD = 3.01), however, were higher than at any other time point during early resettlement.

Table 2. Summary of three-way ANOVA results, pre matching.

Tests of Between-Subjects Effects						
Dependent Variable: RHS-15 score						
Source	SS	df	MS	F	p	η^2
Group	6953.361	1	7829.073	185.460	.001	.281
RCOO	1241.909	4	491.364	11.739	.017	.194
Time	1120.576	3	13.07	19.405	.043	.106
Group x RCOO	987.459	4	134.777	6.730	.001	.285
Group x Time	101.421	3	32.948	4.018	.325	.029
RCOO x Time	567.580	12	49.267	2.035	.461	.064
Group x RCOO x Time	441.027	12	36.049	.972	.524	.078
Error	7018.295	174	41.285			
Total	91764.000	208				

In addition, results indicated statistically significant differences in distress levels between ethnocultural group, $F(4, 208) = 11.74, p = .017, \eta^2 = .194$, with higher mean scores for refugees from Iraq (Mean = 21.81, SD = 4.14) than for the DRC (Mean = 20.53, SD = 5.59) Burma (Mean = 18.73, SD = 2.09), Somalia (Mean = 13.23, SD = 2.61), and Bhutan (Mean = 12.94, SD = 2.49).

Table 3. Estimated Marginal Means of Ethnocultural Background Pre Matching.

Ethnocultural Group	Mean	SD	n
Burma	18.730	2.087	59
Iraq	21.814	4.137	47
Bhutan	12.937	2.490	41
Somalia	13.229	2.612	26
DRC	20.529	3.589	35

Section 2: Propensity Score Analyses with Risk Set Matching

In this section, the results from the propensity score analysis utilizing three matching approaches are presented with respect to the differences observed in balance of time-varying covariates from pre to post matching. Descriptions of the each time-varying covariate are included in Table 5 below.

Table 4. Descriptions for all variables used in analyses

Variable	Definition	Type and Range
Income	Household income per month	Continuous
Household size	Number of persons living in household (adults and children)	Continuous
English Skills	How comfortable are you speaking in English? (Y/N)	Categorical
Employment	Are you currently employed? (Y/N)	Categorical
Family in Denver	Do you have family living in Metro Denver Area? (Y/N)	Categorical
Country of Origin/Camp	Do you have family living in country of origin or camp? (Y/N)	Categorical

First, the treated and untreated groups were specified at each time point using the scoring cutoff. Any individual who scored ≥ 12 was placed in the treated group and any

individual who scored < 12 was placed in the untreated group. Utilizing program evaluation language, a refugee in “treatment group” in this case represented an individual with high expression of distress, whereas a refugee in “control group” represented an individual with low expression of distress. As previously described, whether a refugee reported a high or low level of distress was measured the RHS-15 standardized cutoff (Hollifield et al., 2013).

This procedure was performed at each follow up screening time point where time varying covariates were collected with sufficient cases; that is, time point 2 (approximately 3 months) through time point 5 (approximately 12 months). Prior to propensity score analysis, descriptive analysis was performed to explore the balance among the six time-varying covariates at each time point. In specific, the standardized difference for each time-varying covariate was examined at the follow up screening time points (3 months, 6 months, 9 months and 12 months). Next, the treatment and control groups were matched with time varying covariates that are unbalanced at each of the four time points, respectively, utilizing the following three different techniques detailed in Table 5 below.

Table 5. Comparison of three matching approaches, nearest neighbor 1:1, nearest neighbor 1:2, and Mahalanobis distance.

	Nearest Neighbor 1:1	Nearest Neighbor 1:2	Mahalanobis Distance
Abbreviation	NN 1:1	NN 1:2	MDM
Procedure	Use only 1 match per treated based on absolute difference. The control and treatment subjects are randomly ordered. Then the first treated subject is selected along with a control subject with a propensity score closest in value to it.	Use 2 matches per treated based on absolute difference. The control and treatment subjects are randomly ordered. Then the first treated subject is selected along with a control subject with a propensity score closest in value to it.	Use 1 match based on the smallest Mahalanobis distance. The treatment and control subjects are randomly ordered, then matched based on the smallest Mahalanobis distance. The process is repeated until each treatment subject is matched and then the unmatched control subjects are removed.

The objective of the propensity score analysis was to specify a functional form of the time-varying covariates for the propensity score model. The propensity score is a balancing score representing a vector of covariates. That is, if a pair of refugees in each treatment group shared a similar propensity score, the pair is considered analogous despite having potentially differing on specific time-varying covariate values (Guo & Fraser, 2015; Austin, 2010). After the balancing scores were estimated in each technique, the scores were used to match refugees to the treatment and control group with the aim of making the two groups of individuals as similar as possible.

Subsequently, standardized difference values were estimated to assess balance after each matching technique. At each time point, standardized difference was assessed before and after matching to examine the balance between treatment conditions in the study. In addition, back-to-back histograms were compared before and after matching to assess changes in the distribution of continuous and categorical covariates between the treatment conditions. Results of standardized differences, before and after matching, are presented for each of the three techniques in Table 6 through Table 9 below. Following

the tables is a summary of findings drawn from comparing time-varying covariates before and after matching at each time point.

Table 6. Assessment of balance for time-varying covariates at 3 months using nearest neighbor matching 1:1, nearest neighbor matching 1:2, and Mahalanobis distance matching

Comparison of Standardized Differences Pre and Post Matching (For Time Varying Covariates at Time 2)

	Before Matching	After NN 1:1	% Improvement	After NN 1:2	% Improvement	After MDM	% Improvement
Employ	0.822	0.429	100	0.327	86.32	0.267	72.63
Camp or country of origin	0.692	0.185	69.77	0.187	69.77	0.185	69.77
EnglishS	0.063	0.384	---	0.609	---	0.385	---
EnglishV	0.447	0.477	---	0.447	---	0.447	---
Income	0.529	0.376	36.9	0.218	80.6	0.289	49.91
Household size	0.347	0.092	74.13	0	83.58	0.048	87.06

The balance of three categorical time-varying covariates including employment, family in camp or country of origin, and English were assessed prior to matching at 3 months (Time 2). As English had three categories, the following two dummy variables were created: EnglishS and EnglishV. In addition, the balance of two continuous time-varying covariates, household size and income, was assessed before matching procedures. Prior to matching, the standardized difference indicated the overall covariate imbalance was high, particularly for employment (.822), family in camp or country of origin (.692), income (.529), EnglishV (.447), and household size (.347) (See Table 6 above).

Next, the propensity score model for matching was specified as a general linear model with the following time-varying covariates: income, employment, family in camp or country of origin, EnglishV. Results demonstrated substantial improvements after

performing each matching technique to balance time-varying covariates at 3 months between refugees in the treatment and control groups. In particular, employment saw high improvements of 100% (NN 1:1), 86.32% (NN 1:2), and 72.63% (MDM), household size demonstrated an increase of 74.13% (NN 1:1), 83.58% (NN 1:2), and 87.06% (MDM), and family in camp or country of origin showed a nearly 70% improvement after each type of matching.

Income only demonstrated a moderate improvement of 36.90% and 49.91% with NN 1:1 and MDM, respectively, yet there was an 80.60% increase with NN 1:2. EnglishS and EnglishV, however, was found to be problematic in an assessment of balance post matching with a standardized difference above .25, and continued to fall short of this cutoff after each of the three matching approaches were performed. Therefore, NN 1:1, NN 1:2 and MDM matching appeared to have marginal impact on balancing English S or EnglishV across treatment groups. By examining the back-to-back histogram at 3 months, however, it was apparent that the matching improved the overall balance between time-varying covariates between treatment conditions (Appendix C). Overall, the greedy nearest neighbor matching 1:2 performed superiorly in improving the balance of time-varying covariates among treatment conditions. In comparison, Mahalanobis distance matching and greedy nearest neighbor matching 1:1 performed similarly in balancing time-varying covariates among treatment groups.

Table 7. Assessment of balance for time-varying covariates at 6 months using nearest neighbor matching 1:1, nearest neighbor matching 1:2, and Mahalanobis distance matching

Comparison of Standardized Differences Pre and Post Matching (For Time Varying Covariates at Time 3)

	<i>Before Matching</i>	After NN 1:1	% Improvement	After NN 1:2	% Improvement	After MDM	% Improvement
Employ	0.284	0.498	70.64	0.264	8.26	0.324	-13.76
Camp or country of origin	0.738	1.095	40.91	0.589	90.53	0.602	17.8
EnglishS	0.543	0.617	53.47	0.589	19.55	0.413	23.26
EnglishV	0.544	0.617	24	0.544	---	0.617	-24
Income	0.153	---	---	---	---	0.106	---
Household size	0.24	---	---	---	---	0.057	---

The balance of three categorical time-varying covariates including employment, family in camp or country of origin, and English were assessed prior to applying the three matching approaches at 6 months (Time 3). As English had three categories, the following two dummy variables were created: EnglishS and EnglishV. In addition, the balance of two continuous time-varying covariates, household size and income, was assessed before matching procedures. Prior to matching, the standardized difference indicated the overall covariate imbalance was high, particularly for family in camp or country of origin (.738) and EnglishS (.543) and EnglishV (.544). (See Table 7 above).

Next, the propensity score model for matching was specified as a general linear model with the following time-varying covariates: employment, family in camp or country of origin, EnglishS, and EnglishV. Findings revealed considerable improvements after performing matching on time-varying covariates in 6 months cohort of refugees. In particular, employment saw an improvement of 70% with NN 1:1, however negligible improvement was found with NN 1:2 matching approach (8.26%) and MDM performed very poorly (-13.72%). English skills showed a 54% improvement post matching with

NN 1:1, however less improvement was demonstrated with MDM (23.26%) and NN 1:2 (19.55%) approaches. Family in camp or country of origin demonstrated improvement of 90.53% (NN 1:2), 40.91% (NN 1:1), and 17.80% (MDM). With a standardized difference above .25, however the covariate remained imbalanced across treatment groups.

Household size and income demonstrated standardized differences below .25, thus were considered balanced and not included in the specification of the propensity score model. By examining the back-to-back histograms before and after matching at 6 months, it is apparent that the matching improved the overall balance of time-varying covariates between treatment conditions (See Appendix C). Despite improvements, imbalances still remained in employment, family in camp or country of origin, and EnglishS and EnglishV. Generally, greedy nearest neighbor matching approach demonstrated the greatest improvement in balance among time-varying covariates in treatment conditions at 6 months. Nearest neighbor 1:1 matching performed quite similarly to nearest neighbor 1:2 matching. Mahalanobis distance matching, however, showed marginal improvements in balancing time-varying covariates across treatment groups.

Table 8. Assessment of balance for time-varying covariates at 9 months using nearest neighbor matching 1:1, nearest neighbor matching 1:2, and Mahalanobis distance matching

Comparison of Standardized Differences Pre and Post Matching (For Time Varying Covariates at Time 4)

	<i>Before Matching</i>	After NN 1:1	% Improvement	After NN 1:2	% Improvement	After MDM	% Improvement
Employ	1.358	1.21	7.07	0.957	36.11	1.469	-4.56
Camp or country of origin	0.997	0.671	29.88	0.816	43.9	0.671	29.88
EnglishS	0.577	0.382	32.35	0.051	-1.47	0.382	32.35
EnglishV	0.016	0.016	---	0.204	---	0.016	---
Income	1.11	0.914	14.02	0.812	71.02	1	17.17
Household size	0.472	0.493	---	0.195	---	0.471	---

The balance of three categorical time-varying covariates including employment, family in camp or country of origin, and English were assessed prior to matching at 9 months (Time 4). As English had three categories, the following two dummy variables were created: EnglishS and EnglishV. In addition, the balance of two continuous time-varying covariates, household size and income, was assessed before matching procedures. Prior to applying three matching approaches, the standardized difference indicated the overall covariate imbalance was severe, particularly for employment (1.358), family in camp or country of origin (.997) and income (1.110), and EnglishS (.577) and Household size (.472). (See Table 8 above).

Next, the propensity score model for matching was specified as a general linear model with the following time-varying covariates: employment, family in camp or country of origin, EnglishS, and EnglishV. Results from the three matching procedures led to negligible improvements in balancing time varying covariates across refugees in treatment and control conditions at 9 months. For example, EnglishS showed a moderate improvement of 32.35% using NN 1:1 and MDM techniques; however, NN 1:2 approach

worsened the imbalance in EnglishS across treatment groups. Family in camp or country of origin demonstrated 43.90% improvement after NN 1:2 matching, while NN 1:1 and MDM led to less improvement (29.88%).

Income and employment saw minimal improvement at 14% and 7% respectively with NN 1:1 matching, the time-varying covariates were found to have a standardized difference of greater than .25. Thus, the covariates were substantial imbalances remained across treatment groups. Household size also continued to be problematic post matching with a standardized difference above the .25 cutoff after performing the three matching procedures. By examining the back-to-back histogram at 9 months, it is clear that matching led to negligible improvements in the overall balance of time-varying covariates between treatment conditions (See Appendix C.) Relatively, nearest neighbor 1:2 matching performed slightly superior to nearest neighbor 1:1 matching, and Mahalanobis distance matching had the least impact on improving imbalances among time-varying covariates among treatment groups.

Table 9. Assessment of balance for time-varying covariates at 3 months using nearest neighbor matching 1:1, nearest neighbor matching 1:2, and Mahalanobis distance matching

Comparison of Standardized Differences Pre and Post Matching (For Time Varying Covariates at Time 5)

	<i>Before Matching</i>	After NN 1:1	% Improvement	After NN 1:2	% Improvement	After MDM	% Improvement
Employ	0.349	0.361	3.45	0.045	88.92	0.361	3.45
Camp or country of origin	2.191	2.189	---	2.19	---	2.191	---
EnglishS	0.226	0.485	57.1	0.73	-72.5	0.237	-5
EnglishV	0.036	0.167	---	0.18	---	0.146	---
Income	0.057	0.081	---	0.003	---	0.068	---
Household size	0.553	0.323	41.99	0.19	84.16	0.537	1.38

The balance of three categorical time-varying covariates including employment, family in camp or country of origin, and English were assessed prior to matching at 12 months (Time 5). As English had three categories, the following two dummy variables were created: EnglishS and EnglishV. In addition, the balance of two continuous time-varying covariates, household size and income, was assessed prior to matching. Prior to conducting the three matching techniques, the standardized difference indicated there were substantial imbalances in the time-varying covariates among treatment conditions, particularly for family in camp or country of origin (2.191), employ (.349), EnglishS (.226), and household size (.553). (See Table 9 above).

Next, the propensity score model for matching was specified as a general linear model with the following time-varying covariates: employment, family in camp or country of origin, EnglishS, and household size. Post-matching results led to marginal improvement in the balance of time-varying covariates among refugees in treatment and control groups at 12 months. In specific, moderate improvements were found for EnglishS, which demonstrated a 57.10% improvement with NN 1:1 matching, however

NN 1:2 and MDM techniques worsened the imbalance of EnglishS among treatment groups. (See Table 10). In contrast, household size showed 84.16% improvement after NN 1:2 matching and 41.99% after NN 1:1 matching. However, no improvement (1.38%) for household size was found with MDM approach. In addition, employment saw marginal improvement at 3.45% with NN 1:1 and MDM, thus the time-varying covariate was found to have a standardized difference of greater than .25 indicating that imbalances remained across treatment groups. As income was found to have a standardized difference well below .25, it was not included in the specification of the propensity score model.

Notably, family in camp or country of origin was found to be imbalanced prior to matching with standardized difference values above .25. However, negligible improvement was evident after performing all matching techniques. By examining the boxplot at 12 months, it confirmed that matching led to marginal improvements in the overall balance of time-varying covariates between treatment conditions (See Appendix C). Ultimately, greedy nearest neighbor 1:2 demonstrated the greatest ability to improve balance in time-varying covariates among treatment groups at 12 months, with nearest neighbor 1:1 performing comparably. Mahalanobis distance performed especially poor, with effectively no improvement in balance found between treatment groups.

Overall, the three matching procedures resulted in substantial improvement in the balance of time-varying covariates across refugees in treatment and control groups at 3 months (time 2) and 6 months (time 3). In contrast, negligible improvements were found

after performing all three matching approaches on time-varying covariates between refugees in the treatment and control conditions at 9 months and 12 months. Nonetheless, improvements were seen in specific items at each of these time intervals. Overall, greedy nearest neighbor 1:2 without replacement outperformed nearest neighbor 1:1 and Mahalanobis distance matching techniques. Consequently, the NN 1:2 matched samples were retained for follow up inferential analyses.

Sample sizes of the matched samples at each time point are displayed in Table 10 below. At time 2, propensity score analysis produced a total of 26 in the control group and 17 in the treatment group. By far, refugees from Burma retained the highest number of cases in the matched sample at 3 months with 17 placed in the control and 3 in the treatment group. At time 3, a total of 23 refugees were assigned to the control group, whereas a total of 31 were assigned to the treatment group. Similar to the previous time point, refugees from Burma comprised the largest number of cases in the matched sample with 16 in the control condition and 7 in the treatment condition. Additionally, refugees from Iraq rounded out the matched sample with 18 assigned to treatment and 2 to control.

At time 4, matching procedures generated a total of 27 in the control condition and 18 in the treatment condition. Again, refugees from Burma and Iraq made up the majority of the matched sample at 9 months with 13 and 4 in control, and 3 and 10 in treatment, respectively. Finally, matching procedures resulted in a total of 21 assigned to control group and 25 assigned to treatment group at time 5. Refugees from Iraq comprised the largest number of cases in the matched sample with 14 in the treatment

and 3 in the control. At each time point, matching procedures generated a low number of matched cases among refugees from Bhutan/Nepal, Somalia and Democratic Republic of Congo. This raised concerns about the potential impacts the reduced samples would have on the power of the follow up inferential analysis as well as the ability to respond to the first two primary research questions guiding the study. Nonetheless, the scenario provided a formidable opportunity to test the limits of small matched samples in inferential analyses. In the following section, description and findings for a three-way factorial design is presented with commentary.

Table 10. Matched Treatment and Control Samples at each Time Point

	<u>Time 2</u>		<u>Time 3</u>		<u>Time 4</u>		<u>Time 5</u>	
	<i>Control</i>	<i>Treatment</i>	<i>Control</i>	<i>Treatment</i>	<i>Control</i>	<i>Treatment</i>	<i>Control</i>	<i>Treatment</i>
<i>Burma</i>	17	3	16	7	13	3	8	3
<i>Iraq</i>	3	5	2	18	4	10	3	14
<i>Bhutan</i>	4	2	2	2	2	1	4	2
<i>Somalia</i>	1	3	2	1	3	2	3	4
<i>DRC</i>	1	4	1	3	4	2	3	2
<i>Total</i>	26	17	23	31	27	18	21	25

Section 2: Three-way Factorial Analysis of Variance Post Matching

In the second phase of analyses, a three-way analysis of variance (ANOVA) was performed to examine the potential effects of ethnocultural background (RCOO), length of resettlement (TIME), on estimating the distress level to determine treatment group

(GROUP) of newly arrived refugees. Specifically, a 5x4x2 between-subjects factorial design was utilized in the analyses. The ethnocultural background factor had five levels, including 1) Bhutan/Nepal, 2) Burma, 3) Iraq, 4) The Democratic Republic of Congo, and 5) Somalia. The length of resettlement was comprised of four time points, spanning from 3 months to 12 months of resettlement in approximately 3-month intervals. The treatment group was comprised of the mean differences between refugees in treatment and control conditions. In this section, results are presented with respect to interactions, main effects, and simple effects.

Assumptions and Power

Prior to conducting the analysis of variance, descriptive analysis was utilized to check the three primary assumptions. Independence was found to be met. However, the assumption of homogeneity of variance was violated for time and ethnocultural background and the assumption of normality was violated with skewness of ethnocultural background in Somalia and DRC. However, the analysis of variance was found to be robust with respect to violations of homogeneity of variance and normality due to a balanced design (Keppel & Wilkens, 2004).

Matching generated a modest sample ($n = 188$) to perform the ANOVA. A power analysis a priori conducted in G*power software (Faul et al., 2007) revealed that on the basis of the mean, between-groups comparison effect size observed in the present study ($\eta^2 = .13$), an sample size of approximately 128 would be needed to obtain statistical power at the recommended .80 level or higher (Cohen, 1988). Although the moderate sample size included in the analyses met the estimated sample size needed to obtain

statistical significance for a power of .80, the sample size of each group varied considerably (See Table 11 below). Limitations due to the restricted sample size between groups are discussed in the Chapter 5.

Table 11. Sample size of matched samples included in three-way factorial ANOVA.

<u>Sample Size: Between-Subjects</u>		
<u>Factors</u>		
		N
Tx Group	High distress	91
	Low distress	97
Time	3 months	43
	6 months	54
	9 months	45
	12 months	46
RCOO	Burma	57
	Iraq	54
	Bhutan/Nepal	26
	Somalia	25
	DRC	26

Findings from the three-way ANOVA

Main effects, interactions, and simple effects were performed to examine potential mean differences between time and ethnocultural background in estimating differences in distress levels of newly arrived refugees. The analytic steps taken are illustrated in Figure 4, and a summary of the three-way ANOVA results is presented below.

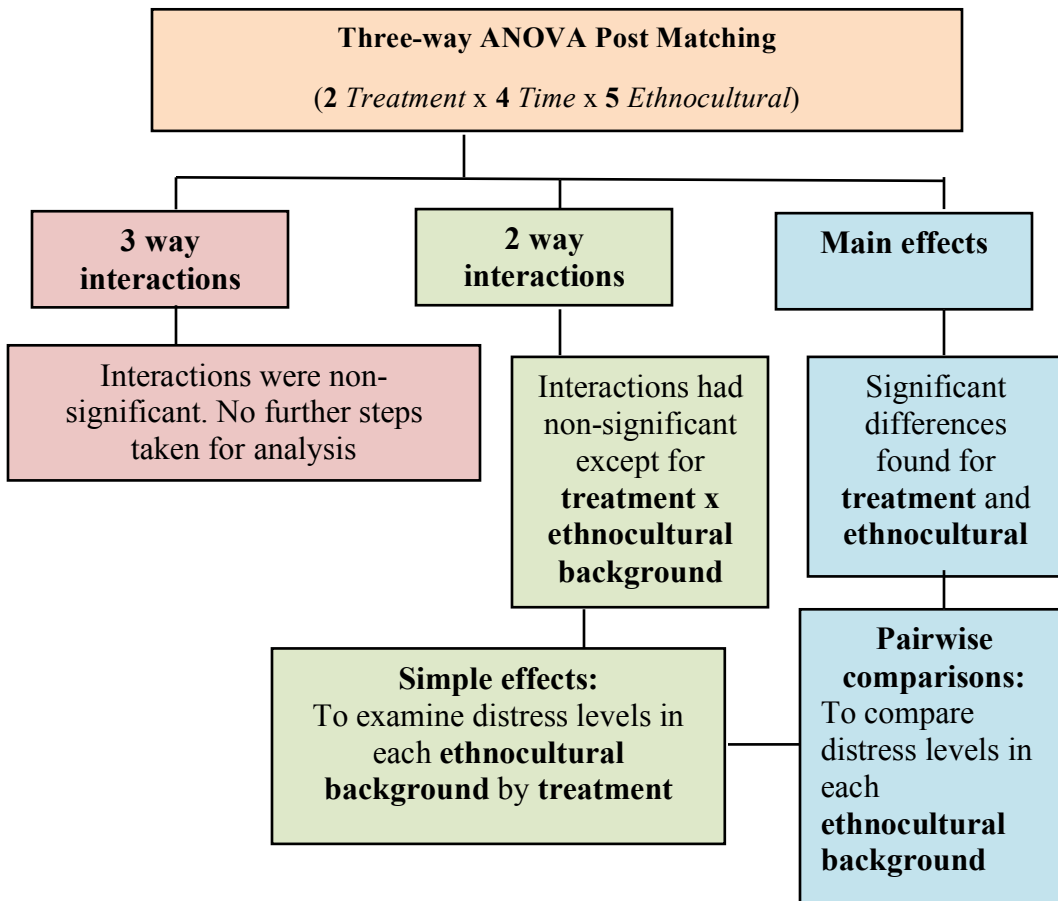


Figure 9. Analysis procedures for three-way ANOVA post matching.

As shown in Table 12 below, an interaction between treatment condition and ethnocultural background was found to be statistically significant, $F(4, 187) = 134.78, p = .006, \eta^2 = .09$. Due to the significant interaction between group and ethnocultural background, main effects were performed in follow up to examine the interaction contrasts in treatment group factor and ethnocultural background factor. Findings revealed a statistically significant difference in distress levels between ethnocultural background, $F(4) = 7.747, p < .006, \eta^2 = .17$. No statistically significant main effect was revealed for time, $F(3, 187) = .24, p = .87, \eta^2 = .005$. In contrast, a statistically significant main effect was found for treatment group, $F(1, 187) = 178.79, p < .001, \eta^2 = .55$. This result indicated the RHS-15 scores of newly arrived refugees differed by treatment condition. On average, the distress of newly arrived refugees in control group was found to be significantly higher ($M = 22.40$) in comparison to the distress of newly arrived refugees in the treatment group ($M = 7.01$).

Table 12. Summary of three-way ANOVA results, post matching.

Tests of Between-Subjects Effects						
Dependent Variable: RHS-15 score						
Source	SS	df	Mean Square	F	p	η^2
Group	6460.547	1	6460.547	178.787	.000	.547
RCOO	1119.825	4	279.956	7.747	.000	.173
Time	25.853	3	8.618	.238	.869	.005
Group * RCOO	539.107	4	134.777	3.730	.006	.092
Group * Time	75.263	3	25.088	.694	.557	.014
RCOO * Time	465.340	12	38.778	1.073	.387	.080
Group * RCOO * Time	352.393	12	29.366	.813	.637	.062
Error	5348.053	148	36.135			
Total	78291.000	187				

As the ethnocultural factor was comprised of five levels, follow up pairwise comparisons were conducted to further explore differences in distress levels between the treatment and control group each of the five levels of ethnocultural background. Together, the mean differences at each level of ethnocultural background in Table 13 and patterns of distress displayed in Figures 10 through 14 were explored to evaluate any salient differences in distress between distinct ethnocultural backgrounds.

Table 13. Pairwise Comparison Tests for Ethnocultural Background

Ethnocultural Background - Pairwise Comparisons						
Dependent Variable: RHS-15 score						
Ethnic	Ethnic	Mean Difference	SE	p	95% Confidence Interval	
					Lower Bound	Upper Bound
Burma	Iraq	-8.397*	1.721	.000	-11.798	-4.995
	Bhutan	-3.467*	1.677	.040	-6.780	-.154
	Somalia	.231	1.745	.895	-3.218	3.680
	DRC	-4.575*	1.717	.009	-7.968	-1.183
Iraq	Burma	8.397*	1.721	.000	4.995	11.798
	Bhutan	4.930*	1.856	.009	1.262	8.598
	Somalia	8.628*	1.919	.000	4.837	12.419
	DRC	3.822*	1.893	.045	.082	7.562
Bhutan	Burma	3.467*	1.677	.040	.154	6.780
	Iraq	-4.930*	1.856	.009	-8.598	-1.262
	Somalia	3.698	1.879	.051	-.014	7.410
	DRC	-1.108	1.852	.550	-4.768	2.552
Somalia	Burma	-.231	1.745	.895	-3.680	3.218
	Iraq	-8.628*	1.919	.000	-12.419	-4.837
	Bhutan	-3.698	1.879	.051	-7.410	.014
	DRC	-4.806*	1.914	.013	-8.590	-1.023
DRC	Burma	4.575*	1.717	.009	1.183	7.968
	Iraq	-3.822*	1.893	.045	-7.562	-.082
	Bhutan	1.108	1.852	.550	-2.552	4.768
	Somalia	4.806*	1.914	.013	1.023	8.590

*. The mean difference is significant at the .05 level.

Table 14. Estimated Marginal Means for Ethnocultural Background.

Ethnocultural Background - Means				
Dependent Variable: RHS-15 score				
Ethnic	Mean	SE	95% Confidence Interval	
			Lower Bound	Upper Bound
Burma	11.460	1.079	9.328	13.592
Iraq	19.857	1.341	17.207	22.508
Bhutan	14.927	1.283	12.391	17.463
Somalia	11.229	1.372	8.518	13.940
DRC	16.035	1.335	13.397	18.674

Notably, Iraqi refugees presented with the highest levels of distress among the five ethnocultural backgrounds (See Table 14). In specific, newly arrived refugees from Iraq were found to have significantly higher distress levels (Mean = 19.86) than newly arrived refugees from Burma (Mean = 11.46), Bhutan/Nepal (Mean = 14.93), Somalia (11.23) and the Democratic Republic of Congo (16.04). Bhutanese/Nepali refugees presented with significantly higher distress levels (14.93) than refugees from Burma (11.46) and Somalia (11.23).

Pairwise comparison findings also revealed the distress of newly arrived refugees from the Democratic Republic of Congo (Mean = 16.04) was significantly higher than distress of refugees from Somalia (11.23) and Bhutan/Nepal (14.93). In contrast, newly arrived refugees from Somalia presented with the lowest levels of distress among the five ethnocultural backgrounds. That is, Somali refugees were found to have lower levels of distress (Mean = 11.46) than newly arrived refugees from Iraq (19.86), the Democratic Republic of Congo (16.04), Bhutan/Nepal (14.93), and Burma (11.46).

In Figure 10 below, distress levels by time are displayed for each ethnocultural background within each treatment group. Although time as a factor in the factorial model was found to be non-significant, distinct patterns can be perceived for each treatment condition. For refugees from Burma with treatment group, high levels were maintained from 3 months to 9 months of resettlement until a dip in distress can be observed from 9 months to 12 months. Refugees from Burma in the control group appeared to continue to decrease until 6 months when a gradual increase in distress can be observed from 9 months to 12 months.

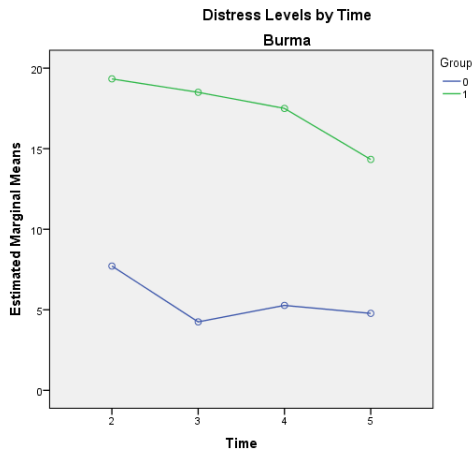


Figure 10. Distress levels between newly arrived refugees from Burma by treatment group by time.

In Figure 11 below, newly arrived refugees from Iraq in treatment group appeared to slowly increase in distress through 9 months of resettlement, then slightly decline when approaching a year of resettlement. Alternatively, refugees from Iraq in control maintained comparably low levels of distress over early resettlement with a reduction at 9 months, then returning to a baseline level of distress (See Figure 12 below). Newly

arrived refugees in treatment condition from Bhutan/Nepal saw a decline in their distress levels from 3 months to 6 months, while distress levels increased at 9 months and plateaued through 12 months of resettlement. Notably, refugees from Bhutan/Nepal in control condition displayed a parallel pattern of distress over time.

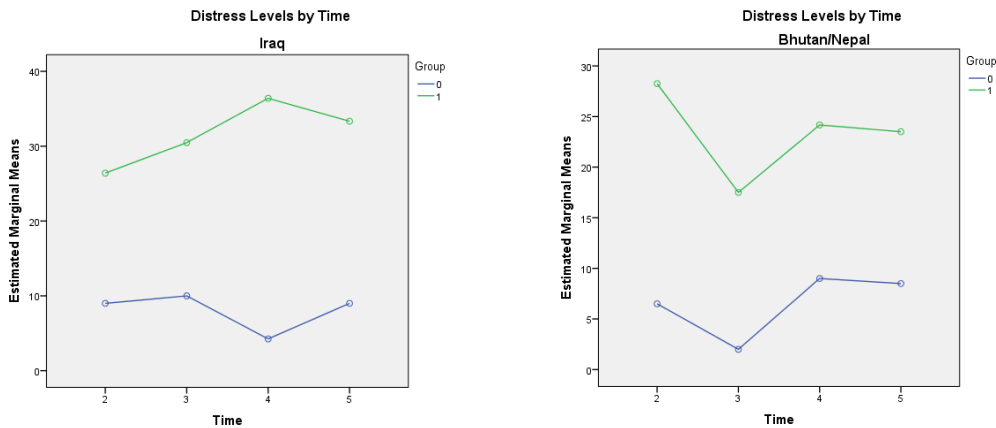


Figure 11 and 12. Distress levels between newly arrived refugees from Iraq and Bhutan/Nepal, respectively, by treatment group by time.

In Figure 13 below, Somali refugees in treatment group maintained a high level of distress through 6 months, then their distress steadily increased through 12 months. Refugees from Somalia in control group appeared to initially decline from 3 months to 6 months, afterwards slowly increasing through 12 months. Finally, newly arrived refugees from the Democratic Republic of Congo in treatment group revealed sharp increases from 3 months to 6 months, then appeared to decrease gradually through 12 months back to a baseline level of distress (See Figure 14). In contrast, Congolese refugees in control group appeared to show marginal increases from 3 to 6 months, then level off and maintain low distress through 12 months of resettlement.

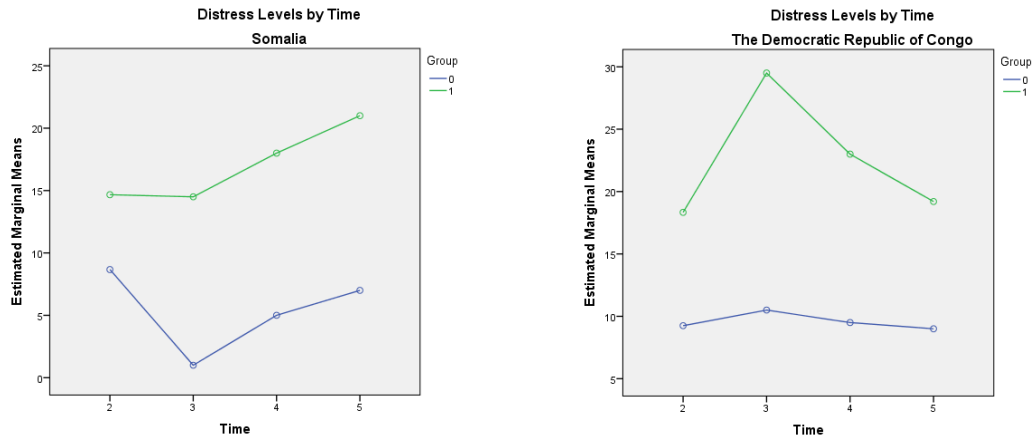


Figure 13 and 14. Distress levels between newly arrived refugees from Somalia and the DRC by treatment group by time.

Part 2: Qualitative Strand

“The teeth are smiling, but is the heart?” -Congolese Proverb

The purpose of the qualitative strand was to explore newly arrived refugees’ experiences in their present home environment, pre arrival livelihoods, and post arrival circumstances in order to contextualize and expound on the quantitative results. Findings in the three-way factorial analysis revealed statistically significant differences in the distress levels between each of the five ethnocultural backgrounds included in the present study. As such, a deductive coding scheme rooted in Agers & Strang’s (2004) Indicators of Integration conceptual framework was developed to analyze qualitative data collected in clinical screening interviews during early resettlement with newly arrived refugees (Ritchie & Lewis, 2003).

The first section of this chapter is devoted to describing the analytic process, specifically the systematic steps taken during analyses to make sense of the qualitative data in lieu of the quantitative results. The second section of this chapter is dedicated to unpacking findings in three sections. In the second part, differences and similarities in the home environments of each ethnocultural background are presented to better understand how safety and stability of home life may contribute to the differences in distress levels identified in the quantitative strand. In the third section, pre and post arrival experiences are compared and contrasted to illuminate the past and continuous traumatic stressors in the lives of newly arrived refugees from Burma, Iraq, Bhutan/Nepal, Somalia, and the Democratic Republic of Congo.

Analyses

Ager and Strang's (2004) conceptual framework on Indicators of Integration is structured around 10 core domains illustrated in Figure 15 below. From these 10 core domains, several coding schemes were developed for coding the textual data using an iterative and reflexive approach. Although coding schemes were predominantly deductive in nature, space was given in the analysis to ensure that important aspects that fell outside the existing 10 domains were acknowledged in the coding.

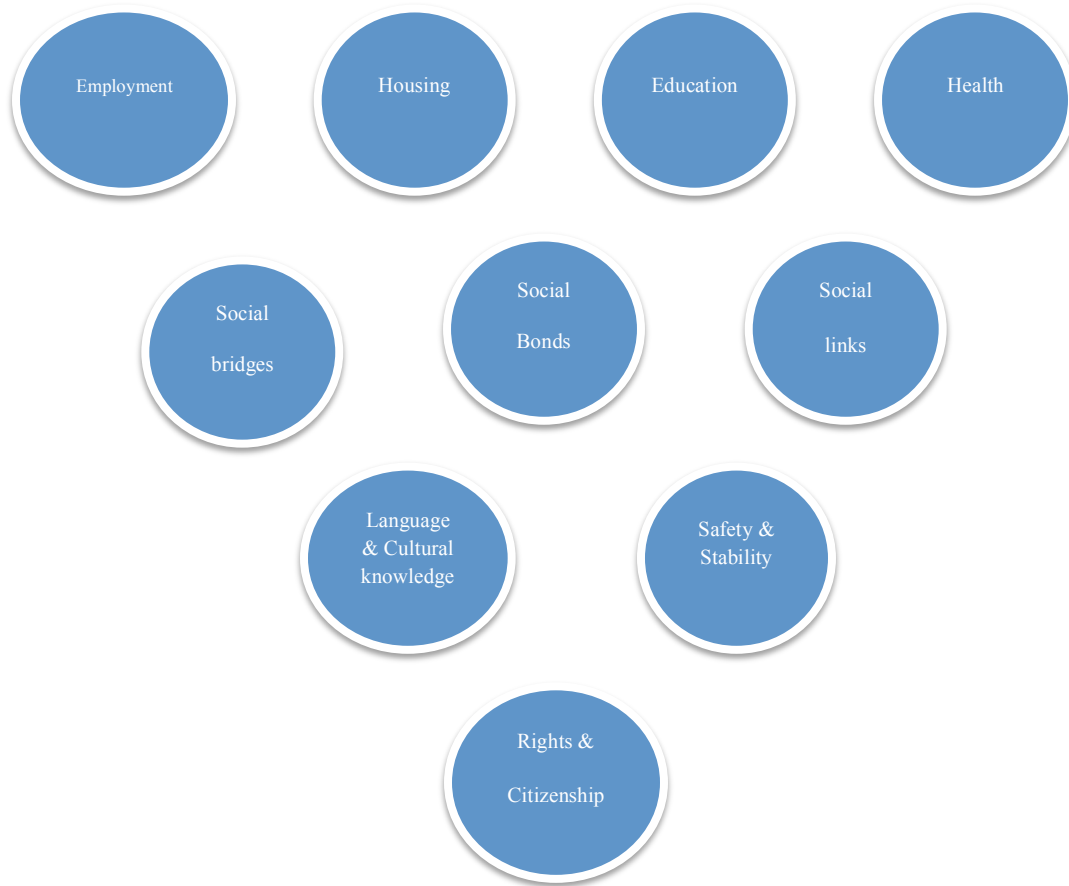


Figure 15. The 10 domains of Indicators of Integration Conceptual Framework (Ager & Strang, 2004).

NVIVO 9.0 qualitative software (QSR International, 2012) was employed to code the textual data, and generate thematic framework matrices for each ethnocultural background. The systematic steps taken in analyses for each of the three content areas – home environment, pre-arrival livelihoods, and post-arrival experiences – explored in the clinical interviews are presented in Figure 16 below.

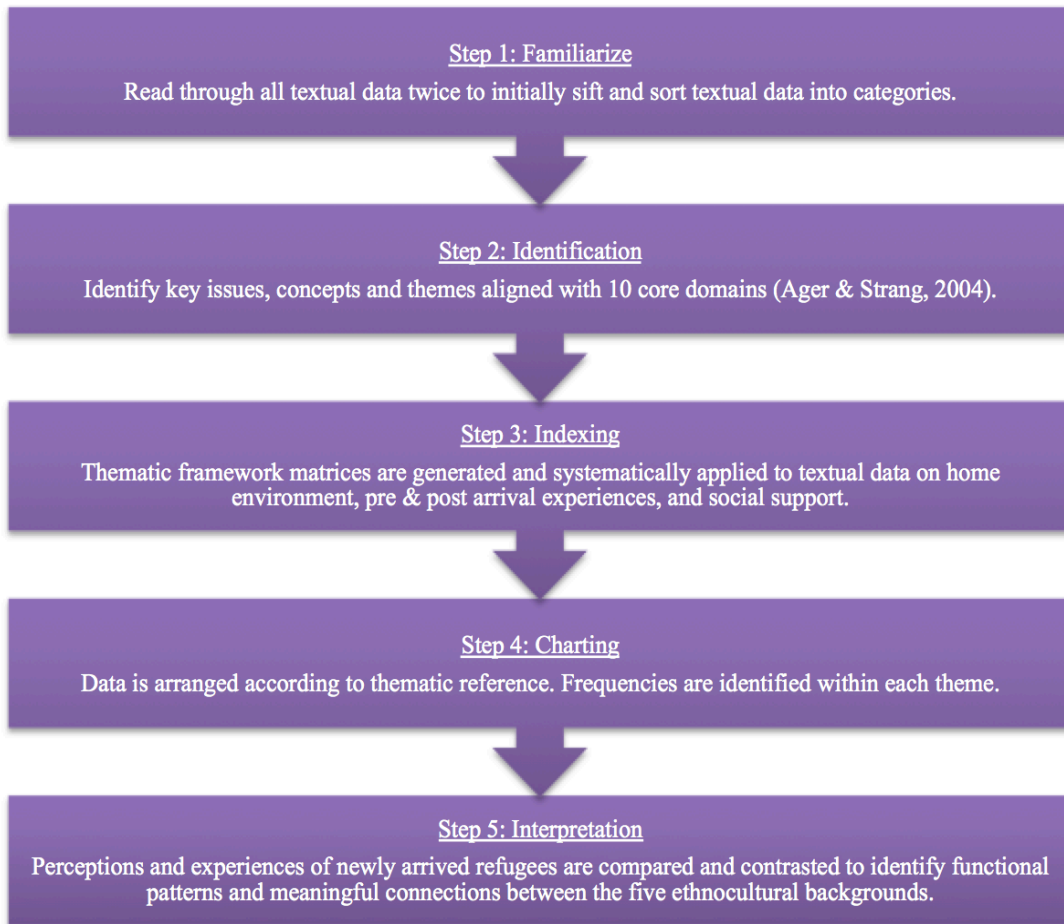


Figure 16. Analytic steps employed in the qualitative strand.

As illustrated in Figure 16, the analyses process began with several iterations of comprehensively reading through the textual data in each the three areas. A primary focus of this initial phase was to orient myself to the content and scope of the data. During this process, the data were sifted and sorted into overarching categories, which were grounded in the Indicators of Integration Conceptual Framework (Ager & Strang, 2004). Three overarching categories emerged with the initial sorting process, including means and markers, social connections, and facilitators. Subsequently, open coding was utilized to

identify critical concepts and themes emerging from the data with respect to the 10 core domains outlined in the Indicators of Integration conceptual framework (see Figure ___ for reference). The emergent themes were then indexed through thematic framework matrices to reduce and link concepts across three content areas (e.g., home environment, pre and post arrival experiences, and sources of social support).

Charting was employed to reorganize themes by theme reference. Thus, preliminary categories, preliminary themes, refined categories, refined themes, final themes and core concepts were arranged according to content area. Frequencies were then tallied to determine the number of instances that newly arrived refugees from each ethnocultural background had expressed perceptions or experiences related to each refined theme. Each framework matrix was analyzed across initial and refined categories and themes in the search to identify core concepts in each content area. Core concepts were identified on the basis of their function in explaining meaningful differences and similarities between the home environments, pre arrival experiences, and post arrival circumstances reported by each ethnocultural group of newly arrived refugees. In the three sections that follow, detailed interpretations of these core concepts will be shared.

Home Environment

*“No one leaves home unless home chases you
fire under feet
hot blood in your belly
it’s not something you ever thought of doing
until the blade burnt threats into
your neck
and even then you carried the anthem under
your breath
only tearing up your passport in an airport toilets
sobbing as each mouthful of paper
made it clear that you wouldn’t be going back.”*

- Excerpt from “No One Leaves Home” by Warsan Shire

The word *home* symbolizes something unique to each of us. To some, it represents a place of contentment and rest. To others, it brings memories of pain, loss, or unrealized dreams. Many individuals leave their home behind in search of prosperity and happiness. For refugees, however, this experience is often magnified by extremeness of their dire circumstances.

Several similarities and differences surfaced through analyses regarding the newly arrived refugees’ perceptions of their home environments. Based on ethnocultural background, refugees expressed divergent levels of comfort, safety, and social support in their home environment. In the following pages, parallel and contrasting findings are presented regarding comfort, safety, and social support that newly arrived refugees from the Bhutan/Nepal, Burma, Iraq, Somalia and the DRC reported during clinical interviews. Selected narrative descriptions are also offered to contextualize findings and to shed light

on differences in the distress levels between ethnocultural backgrounds identified in the quantitative strand.

Comfort in the home

Each ethnocultural group conveyed different degrees of perceived comfort within their home environments. The majority, or 72.7% (16 of 22), of refugees from Bhutan/Nepal described their living conditions as comfortable, whereas newly arrived refugees from Burma, Iraq, Somalia and the DRC expressed contentment with their housing. Approximately half, or 47.5% (19 of 40), Iraqi refugees described their living conditions as comfortable. Of the 19 refugees who were comfortable in their homes, 21.1% explained this was because they had adequate room to accommodate all the persons living in the space. In addition, 36.4% (36 of 99) of refugees from Burma and 31.3% (5 of 16) of refugees from Somalia described being comfortable with living conditions at home. Due to the small, but varying proportion of newly arrived refugees who reported comfortable housing, reasons associated with discomfort with living conditions were further explored in the data.

Among the full sample of newly arrived refugees who participated in the clinical interviews, uncomfortable home environments were described most frequently by newly arrived refugees from Somalia and Burma. That is, 68.7% (11 of 16) of refugees from Somalia and 63.6% (63 of 99) of refugees from Burma expressed discomfort with their housing circumstances. Fighting or loud noises in home or neighborhood as well as lack of space and bed bug infestations were consistently mentioned as reasons for being

uncomfortable at home. Although fewer newly arrived refugees from Iraq and the DRC expressed discomfort with living conditions, approximately half (52.5% and 51.4%, respectively) reported experiences of being uncomfortable in their home environments. Among Iraqi refugees, 28.6% (6 of 21) stated that they did not feel safe at night in the homes or neighborhoods; whereas, 42.9% (9 of 21) described how sharing their living space with too many other people meant no privacy or quiet. As an Iraqi female explained, “I live with 11 others... three families in total. We share one bedroom and one kitchen. It is hard for adults with no privacy and no peace. It is hard for the children with no space to play with each other or to have quiet place to sleep.”

Beyond this, 28.6% (6 of 21) expressed that living conditions were very poor with leaking water and lack of electricity or heat. Similarly, 88.9% (16 of 18) Congolese refugees explained discomfort was related to not having enough space, and 83.3% (15 of 18) described difficulties such as the heat not working, mouse and cockroach infestations, unreliable electricity, and stairs being difficult to use due to age or disability or age. Alternatively, only 18.2% (4 of 22) of refugees from Bhutan/Nepal reported being uncomfortable in housing based on small space or overcrowded conditions.

Safety in the home

Another theme that emerged related to housing was how much sense of safety each ethnocultural group had during early resettlement, and what they perceived as impeding factors to safety in their home environment. Overall, the majority of newly arrived refugees who participated in the clinical interviews conveyed that they felt safe in

their homes and neighborhoods. In particular, 68.2% (15 of 22) refugees from Bhutan/Nepal, 68.7% (68 of 99) refugees from Burma, 65.0% (26 of 40) refugees from Iraq, 68.8% (11 of 16) refugees from Somalia, and 74.3% of refugees from the DRC described feeling safe at home.

Of those who reported not feeling safe, newly arrived refugees described worries about paying rent or basic needs, fears about going outside of their apartment or walking around their neighborhood at night, and concerns about finding a more permanent housing situation. A Somali male refugee described his fear this way:

When I hear loud fighting outside my apartment window, it keeps me awake. It reminds me of bad experiences in the war, and my mind starts to think many thoughts. I do not know who to talk to about this... I'm afraid to report it to the police because I will be threatened.

Role of social support in the home

Among newly arrived refugees who felt comfortable and safe at home, living with or near family members and close friends emerged as a strong contributor to the refugees' perceived sense of safety and comfort in their home environment. Social support seemed to play an especially salient role for refugees from Burma, Somalia, and Iraq. Specifically, 55.9% (38 of 68) of refugees from Burma, 61.5% (16 of 26) of Iraqi refugees, and 80.0% (4 of 5) refugees from the DRC who described feeling comfortable in their home were living with a family member or close friend.

One female refugee from Burma described how family can provide emotional safety and comfort in the home, thus creating key social bonds and links in the early resettlement process. She stated, “When I feel worried or scared at home, I talk to my husband. It brings my heart comfort to have him here. He worries about money for rent, but we have each other and our children, so we have to be strong for them.” An Iraqi male refugee explained the pivotal role his brother had played in helping him feel comfortable at home stating, “My brother has been here for 4 years. He teaches me how to do things here, and helps me get the things I need. Because of his help, I have support and am comfortable to talk about my problems at home.”

Alternatively, a lack of family in Colorado heightened anxiety and stress during early resettlement for newly arrived refugees. Notably, 40.0% of Congolese refugees, 55.0% of Iraqi refugees, and 57.1% of Bhutanese refugees reported that not having their family nearby was upsetting and made it difficult to adjust to their new life. One female Congolese refugee put it this way:

My mother and brother are in the camp [in Malawi]. My sister and her children are still in the Congo. I worry every day for their safety. My mother is not well, so I worry about her health and not being able to care for her. Whenever the phone rings, my heart races and I feel weak. I think it will be bad news. I try to meet people in my neighborhood and talk to my neighbors, but they are not friendly and keep to themselves.

An Iraqi male refugee expressed how a lack of family nearby and close family members in the ongoing conflict in Iraq has impeded his ability to adjust. He explained:

It's hard to move forward in my life here when parents are still at risk in Iraq and in Turkey. My father works for the government and has not been able to leave.

We are not able to speak for his own safety. If government officials find out, then he and others in my extended family will be detained or killed.

Overall, social support, or the lack thereof, emerged as important themes among the newly arrived refugees. Social bonds with family were found to facilitate coping with the difficult adjustment period after arrival to Colorado. In contrast, the absence of close family nearby often has a detrimental impact, leading refugees to worry, become afraid, and feel isolated during early resettlement. Lastly, family that remained in conflict affected areas or in camps with poor access to basic needs was found to contribute to emotional distress of newly arrived refugees.

Pre Arrival Experiences

*I want to go home,
but home is the mouth of a shark
home is the barrel of the gun
and no one would leave home
unless home chased you to the shore
unless home told you
to quicken your legs
leave your clothes behind
crawl through the desert
wade through the oceans
drown
save
be hunger
beg
forget pride
your survival is more important.*

- *Except from "No One Leaves Home" by Warsan Shire*

In the present study, newly arrived refugees' experiences of exile while fleeing, and residing in camps or neighboring host countries unified around the theme of *survival*. The desire to survive surfaced as a salient and vital attribute among the refugees. Although they expressed hope for a durable future in their new home of Colorado to varying degrees, their stark courage and resiliency during experiences in flight was evident in the textual data. At the forefront, threats to safety and stability, health, violations of human rights and loss of citizenship emerged as themes; however, these themes were interwoven. Therefore, as opposed to separating findings out by theme, this section is presented by ethnocultural background to provide the reader with a sense of the layered traumas and stressors endured by each distinct group prior to resettlement.

Pre-arrival life for newly arrived refugees in each ethnocultural group ranged from long-term camp experiences to continuous mobility. For example, all newly arrived Bhutanese/Nepali refugees, 100.0% (22 of 22), had lived in organized refugee camps in Nepal for well over a decade. In fact, Bhutanese refugees reported an average of 18.5 years living in camps. Furthermore, 59.1% (13 of 22) of refugees had fled Bhutan to camps in Nepal when they were young children. Consequently, only 50.0% (11 of 22) expressed that they understood the reasons why their family had originally left Bhutan. Of the refugees who recalled what led their families to flee Bhutan, 72.7% (8 of 11) referenced political tension with the government. Additionally, 63.6% (7 of 11) shared that soldiers, backed by the government, had forced them out of their homes and villages. Experiences of brutality and harassment from police and soldiers affiliated with the government were also expressed by 45.5% (5 of 11) of Bhutanese refugees.

Similarly, 75.0% (12 of 16) of Somali refugees recounted fleeing Somalia to camps in Egypt, Kenya, Ethiopia, and Uganda over 10 years ago, and 43.8% (7 of 16) left Somalia at an early age. However, unlike the Bhutanese refugees, all Somalis described ongoing violence and instability resulting from the prolonged civil war in Somalia had given them no choice but to leave their home and communities behind. The vast majority, 87.5% (14 of 16), expressed they were scared for their lives and had no safety while in flight from Somalia. A Somali woman recalled, “We were not treated as citizens, we faced extreme discrimination. My mother was killed and I was tortured, and they stole all of my family’s belongings – all because of the texture of our hair.” Newly arrived Somali refugees also reported sexual violence and rape, and killing of spouses and family

members prior to and during flight. Also, 87.5% of Somali refugees described meager access to food, health care, medications, firewood, and electricity in the camps prior to resettlement.

Newly arrived refugees from the DRC conveyed a clear understanding of why they left the Democratic Republic of Congo. Over 88% (31 of 35) stated they fled because the war had made their villages volatile settings, with no safety and no peace. Nearly all (94.3%) of the Congolese refugees expressed safety concerns while migrating to camps or host countries. Killings and rape of family members was reported by 57.1% (20 of 35) and 54.3% (19 of 35), respectively. Of the refugees who reported family members were killed in war, 60% stated they had children who were stolen and killed by rebel soldiers. One Congolese woman described her life in a Malawi camp in these terms:

Refugees don't have good lives there... My life was horrible. We were bullied as refugees. Violence was normal... It happened every day. No food, no space, no hospital when we were ill. When I left Congo, I thought violence would stop. Then in the camp, the killing and raping continued.

While the violence raged, refugees explained that economic and educational opportunities were sparse. Within the camps, 67.5% (23 of 35) of refugees from the DRC noted they had no financial resources or job opportunities, and trouble finding food. A Congolese male refugee recalled, "There was a lot of corruption. I had to work in

construction in the camp for food. After working from morning to night, I'd have only one meal. But I was fortunate, others had trouble finding any food at all.”

The pre-arrival experiences of newly arrived refugees from Burma represented both prolonged situations and recent strife. In particular, 38.4% (38 of 99) reported living in camps on the Thai border or in the neighboring host countries of Bangladesh, Malaysia, and Sri Lanka for the past decade. While 46.5% (46 of 99) remembered fleeing Burma at a young age, a handful of refugees, 12.1% (12 of 99) said they didn't understand why their family fled Burma or these reasons were not explained by their parents. Nonetheless, 74.7% (74 of 99) described substantial human rights violations and deficits meeting basic needs prior to resettlement in the United States. For example, refugees from Burma described having no access to education or viable employment in the Thai border camps or host countries as well as restricted food rations and scarce availability of health care and medication. Consequently, 70.0% (70 of 99) described being disturbed by their experiences in the camps, stating their days were filled with constant sadness and worry.

In contrast, newly arrived refugees from Iraq recounted fleeing to makeshift camps and urban areas of host countries such as Turkey, Jordan, and Lebanon within the past several years due to widespread sectarian violence. Iraqi refugees consistently stated that terrorist bombings and attacks were daily occurrences in Baghdad and rural villages. As a result, 91.4% (32 of 35) expressed that life was very challenging due to difficulty accessing food, water, shelter, and electricity after fleeing their homes. Over 60.0% (24

of 40) of Iraqi newly arrived refugees reported professional careers prior to flight. These professions ranged from teacher to social worker to faculty in computer science to architect to successful business owner. What is more, 54.2% (13 of 24) of these professionals worked for US companies or the US Army. One-third (8 of 24) of the professionals directly linked the threats and harassment they experienced with their job activities.

Distinct from the other ethnocultural groups, 12.5% (5 of 40) of Iraqi refugees either had great difficulty speaking about or stated they did not want to discuss their past experiences in Iraq because they were too painful or upsetting. Overall, Iraqis reported high rates of family members killed by militia groups (60.0%), health problems such as incommunicable disease and chronic pain (54.3%), sexual assault and rape (25.7%), and psychosocial issues related to sleep and memory (45.7%). An Iraqi male refugee stated:

I could not sleep at night because of nightmares about things that happened in Iraq and while fleeing the country. In the day, I had difficulty remembering to complete daily tasks. Then at night I could not sleep because I was disturbed by hearing the voices of deceased family members.

Bearing these findings in mind, it is apparent that newly arrived refugees from each ethnocultural background had endured persistent trauma during and post flight. Whether in migration or in camps, each ethnocultural group faced prolonged difficulties accessing basic needs, including food, education, employment, health care, and security.

Differences emerged in terms of length of time in flight, type of violence endured, and loss of identity and status. In addition, the refugees endured human rights violations, which were compounded by a lack of rights and citizenship in the nations they sought refuge in. Therefore, these losses serve as context for the unique and common challenges each ethnocultural group faced upon arrival to their new life in Colorado.

Post Arrival Experiences

“Birds chase fruit; people chase rice”... All humans pursue a good life. -Karen Proverb

“The snake’s talking does not end.” -Iraqi Proverb

Research has established that the health and wellbeing of newly arrived refugees is impacted by past traumatic experiences that occurred in their country of origin, in flight, and in camps prior to resettlement in a third country (Bhatia & Wallace, 2007; Bhugra & Becker, 2005; Steel et al., 2009). As such, it was important to take into account both the pre and post arrival stressors that were described in clinical interviews when exploring differences in distress between newly arrived refugees from Bhutan/Nepal, Burma, Iraq, Somalia, and the DRC.

In comparing and contrasting refugees’ perceptions of early resettlement circumstances, a number of similarities and differences between ethnocultural backgrounds became salient in the clinical interviews. First, refugees from each ethnocultural group expressed differing experiences of safety and stability post arrival to Denver. Second, language and cultural knowledge emerged as a crucial factor during integration across all groups. Third, access to employment and financial resources

surfaced as an essential component across newly arrived refugee groups. Fourth, challenges forming social bonds and maintaining health conditions emerged as themes in relation to adjustment difficulties. Fifth, weather and transportation surfaced as underlying obstacles in early resettlement. Throughout the reporting of findings, connections in newly arrived refugees' challenges and successes during early resettlement are drawn between ethnocultural groups. In addition, excerpts from the interview narratives are shared to expound on each theme.

Safety and Stability

Despite considerable past traumas and current daily stressors, many of the newly arrived refugees expressed the hope that their adjustment would improve with time. For Iraqi refugees, 25% (10 of 40) stated they enjoyed life in Colorado, and of these, 80.0% explained having family in the Denver area aided their adjustment and 40.0% expressed that having a job and consistently working was helping with early resettlement. Similarly to Iraqis, 30.3% of newly arrived refugees from Burma stated they were doing well or happy in Colorado. The majority (63.3%) of these refugees described how family members and friends had supported their adjustment to life in Denver, and helped them navigate transportation, services, and finding work. Likewise, a small subset of Somali and Congolese refugees described life as going well (25.0% and 17.1% respectively). Although 50.0% of newly arrived refugees from Somalia and 35.3% of Congolese refugees had family or close friends in Denver area, they did not express that social bonds with family and friends aided their adjustment in the US.

Overall, 36.4% (8 of 22) Bhutanese refugees expressed being happy and doing well in Colorado – more than any other ethnocultural group. It is noteworthy that of the Bhutanese refugees who described being happy in Colorado, 100.0% had family members living with them or nearby. It was apparent that family served as a protective factor in early resettlement from the way in which refugees conveyed their social bonds with family. For example, a Bhutanese woman described the role that her family had played since arrival this way: “I live with my brother. He has been here for 3 years. Because of this he knows people here and how to get to places. It’s been helpful to have his advice. He knows it is hard and we can talk about things I am confused about here.”

Although a subset of newly arrived refugees from each ethnocultural group voiced contentment with their new lives in Colorado, the majority conveyed they had not expected life to be as difficult as it had been for them in early resettlement. For refugees who expressed that they were struggling in early resettlement, several parallel themes emerged across ethnocultural groups. The difference, however, was revealed in the meaning that refugees from each ethnocultural background placed on each component in early resettlement.

Language & Cultural Knowledge

Overall, newly arrived refugees interviewed from each ethnocultural group spoke about how hard not speaking English had been for them in early resettlement. Newly arrived refugees expressed poor English skills hindered their ability to find consistent work, to meet neighbors in the community, to access transportation and services. A

Bhutanese male refugee stated, “English is very hard. I am afraid to speak it because when I try, people laugh at me and treat me badly.”

Specifically, 84.1% of refugees from Burma, 81.3% of Somali refugees, 79.3% of refugees from the DRC, 67.5% of Iraqi refugees, and 63.6% of Bhutanese/Nepali referenced not speaking English or having difficulty with learning the new language as a stressor since arrival. A Congolese male refugee described his fear of learning English: “I am afraid I cannot learn [English], and I do not want to fail, so I do not go to ESL classes.” Another female refugee from Burma explained, “The language is very hard... I have to take care of my children and my mother who has health issues during the day so I cannot attend ESL.” Even those who were enrolled in ESL classes, often did not feel equipped enough to speak and apply English in everyday tasks such as shopping, transportation, or looking for jobs.

Unemployment and Financial Resources

Another theme that emerged related to stability in early resettlement was economic difficulties. Consistently across each ethnocultural background, newly arrived refugees who expressed that they were struggling with adjustment to life in Colorado described financial concerns. The lack of viable employment surfaced as the predominant barrier to economic stability. A high proportion of refugees from Somalia (90.0%), the DRC (80.0%), Iraq (65.0%), Burma (63.3%), and Bhutan/Nepal (59.1%) reported being unemployed.

Refugees identified a number of reasons for unemployment, including no receipt of employment card, responsibilities taking care of children, disability, health conditions, lack of training and support finding work, and discouragement after being turned down for multiple job opportunities. For refugees who did have jobs, the high cost of rent and daily living (e.g., food stamps, cooking supplies, furniture, etc.) in Denver remained a burden. These economic difficulties were particularly salient for refugees from the DRC (74.0%), Bhutan/Nepal (50.0%) and Burma (43.2%). Alternatively, only 20.0% of refugees from Iraq mentioned economic concerns in interviews. A low proportion of economic concern in Iraqis was an unexpected finding, as 60.0% of Iraqi refugees had described having well-paying professional careers prior to arrival.

Transportation

Transportation barriers emerged as a prominent theme among Iraqi, Bhutanese, and Congolese refugees. Each of the three ethnocultural groups noted how complex the local transportation system was in Denver, and that navigating it required strong English and cultural skills. Transportation appeared to be especially troublesome for refugees from Bhutan/Nepal, as 42.9% mentioned that transportation was stressful and confusing to figure out. Over 20.0% of Somali refugees described similar difficulties with understanding how to use the transportation without English and understanding the geographic proximity of locations. A Somali woman recalled, “At first I had to travel with a friend who knew where things were. I am confused by what signs and streets

mean.” A Bhutanese male refugee spoke about how challenges with transportation impacted his ability to meet others and access services. He explained:

The roads here are full of cars and confusing. I don't understand what the signs say or how to read addresses. I don't know how to ask for help in English, so that makes it very hard. I mostly walk, and I cannot travel far. Some times they send a ride for me. But I often miss appointments because I do not have a way to get there other than to walk or try to find a ride.

Although Iraqi refugees raised parallel concerns with transportation after arrival, 17.5% noted distinctive concerns about relying on others for help or support for transportation. In early resettlement, refugees often rely on the help and support of community members outside their family for learning new systems like transportation.

Role of Social Support in Resettlement

Without family as social bonds and neighbors as social bridges in early resettlement, newly arrived refugees struggled to adjust. A lack of family nearby in Colorado, worrying about family members in camps or country of origin, and challenges with social structures were referenced as primary sources of distress by refugees from each ethnocultural group to varying degrees. For example, being far away from family was described as distressing for 63.6% of refugees from Burma and 57.1% of refugees from Bhutan/Nepal and 50.0% of refugees from Somalia. One Bhutanese/Nepali woman explained, “I am sad and alone without my family. It's been hard to meet neighbors. People keep to themselves and do not talk to each other.” Fewer Iraqi refugees (37.5%)

and Congolese refugees (44.8%) mentioned a lack of family nearby as a primary stressor. However, a substantial number of refugees from Iraq (65.0%) described that having family still living in Iraq or other conflict zones was a major concern. An Iraqi female refugee conveyed the following: “My husband is still there [Iraq]... I worry about his safety every day. At night, I have nightmares that he is kidnapped. Every day I fear that I will never see him again. I have to be strong for our child, but I have no support without him.”

Weather and Health

Additionally, seasonal changes and cold weather were frequently mentioned as a contributing to stress and isolation after arrival. Over 59% of refugees from Burma explained the frequent weather changes and cold in Denver were distressing. One refugee from Burma stated, “When it becomes cold, I do not like to go outside. The snow and cold make it tough to take the bus, and to walk outside. My wife has fallen, and I’m afraid I will fall too.” To lesser degrees, refugees from Bhutan/Nepal (28.6%), Somalia (20.0%), the DRC (17.1%), and Iraq (7.5%) mentioned they were affected by the cold weather.

Given that Burma and Bhutan are monsoon climates, it is not surprising that the transition to winter weather appeared to be most drastic for both of these ethnocultural groups. On the other hand, in some regions in Iraq, winters are cold with storms, which may explain why fewer Iraqis raised concerns about cold weather and snow. Concerns with preparedness for cold weather were also raised by newly arrived refugees, as many

described having poor access to appropriate winter gear such as coats, scarfs, gloves, hats, and boots. A Congolese woman explained, “I arrived here with sandals, so I wear them everywhere in the rain and in the snow.” A male refugee from Burma stated that the pain in his legs and chest becomes worse when it is cold: “When it’s cold, my heart burns and my legs feel numb with pain.”

Although this individual was referring to the effect of the cold on his bodily pain in this instance, physical health conditions and concerns emerged as a germane theme across all newly arrived refugees interviewed with the exception of Somalis. Most substantially, 45.5% of refugees from Burma expressed health concerns; in particular, they spoke about chronic body pain in the legs, back and chest, hypertension, diabetes, head injuries, eating problems, weight loss, constipation, and sleep problems. Nearly 40% of Congolese refugees discussed chronic health concerns related to sleep, panic attacks, and generalized body pain.

In addition, 32.5% of Iraqis reported health problems, including sleep disturbances and insomnia, eating problems, malnutrition, weight loss, epilepsy, kidney and gall bladder issues, hypertension, diabetes, and physical disabilities and chronic pain related to pre-arrival experiences. Bhutanese/Nepali refugees expressed worries about their health related to poor eating habits, malnutrition, chronic pain, weakness, and fatigue to a lesser degree (9.1%). For the majority of newly arrived refugees, appropriate medical care and medications had been inaccessible or infrequent for up to 20+ years

while migrating or living in refugee camps. In turn, the years compounded and exacerbated the sequelae of health conditions and body pain.

Conclusion

Several important themes surfaced from analyzing home environment, pre arrival livelihoods, and post arrival experiences of newly arrived refugees from Bhutan/Nepal, Burma, Iraq, Somalia, and the DRC. First, social bonds with family members played a crucial role in promoting safety and stability among newly arrived refugees, pre and post arrival. From their own perspectives, a lack of family nearby contributed to substantial fear, worry, and sadness in their home environments and in adjustment to their new lives in Colorado. Second, unemployment contributed to distress in migration, camp life, and early resettlement among all ethnocultural groups. Lack of viable job opportunities contributed to stress related to housing costs and basic daily provisions. Third, refugees from each ethnocultural background with limited or no English skills stated that learning English made every aspect of resettlement more challenging. Finally, refugees from the DRC, Burma, and Iraq reported a high proportion of chronic body pain and complex health conditions in early resettlement stemming from prolonged lack of appropriate treatment and medications, and sustained levels of stress.

Chapter 5

Discussion

Part 1: Point of Interface

“To be without knowledge is to be without light.”

Along with food and water for the body, knowledge is essential. It gives life to the mind.

– Somali proverb

Consider the challenges refugees from Bhutan/Nepal, Burma, Iraq, Somalia, and the Democratic Republic of Congo have faced in their lifetime. Each has endured the loss of their home, possessions, and dignity. For refugees who grew up in a war zone or refugee camp, a toxic stress response can develop when a child or young adult experiences strong, frequent, and/or prolonged adversity—such chronic neglect, caregiver loss, substance abuse or mental illness, exposure to violence, and/or the accumulated burdens of family or community economic hardship—without adequate adult support or access to adequate psychosocial support or health care. In turn, this prolonged activation of the stress response systems can disrupt the brain development and other organ systems, and increase the risk for stress-related disease and cognitive impairment, well into the adult years (Shonkoff et al., 2012). Regardless of the events or

hardships that have preceded their arrival to the United States, all newly arrived refugees demonstrated fortitude and resolution to rebuild a new life.

With this context in mind, it is apparent that there is a growing need for efficient and culturally appropriate screening tools to assess mental health distress in newly arrived refugees. To date, however, substantial gaps in understanding of differences in distress levels of newly arrived refugees remain in research (Shannon et al, 2012; Hollifield et al., 2013; Savin et al., 2005). Moreover, no known studies have explored how distress levels may change over time and differ among refugees from distinct ethnic and cultural heritages. In recent years, heightened attention has been placed on applying mixed methods research in humanitarian settings given the complex, multi-layered nature of refugee mental health (Bolton, Tol & Bass, 2009). As such, this sequential explanatory study utilized mixed methods to explore the following three primary research questions:

1. Are there potential changes in distress symptoms (as measured by RHS-15) of newly arrived refugees across the first year of resettlement?

Hypothesis 1: There will significant differences found in the distress levels of newly arrived refugees over the first year of resettlement.

2. If so, are the potential changes in distress symptoms significantly different among the five different ethnocultural groups of newly arrived refugees across the first year of resettlement?

Hypothesis 2: There will be statistically significant differences in distress explained by ethnocultural background of the newly arrived refugees.

3. How do the pre and post arrival experiences of newly arrived refugees from five distinct ethnocultural backgrounds explain potential changes in distress levels during the first year of resettlement?

Initially, propensity scores analysis with balanced risk set matching using three approaches, including nearest neighbor 1:1 without replacement, nearest neighbor 1:2 without replacement, and Mahalanobis distance matching techniques were employed to balance time-varying covariates among refugees in each treatment condition at 3 months, 6 months, 9 months, and 12 months. Follow up inferential tests were performed using a three-way factorial analysis of variance to examine mean differences between high and low distress levels, ethnocultural background, and time. In addition, results of the three-way ANOVA, pre and post matching, were compared to identify the relative impact of propensity score matching approaches on estimation of true treatment effects. Finally, qualitative data was collected through a semi-structured clinical interviews to explore the third research question regarding potential factors related to ethnocultural variability in the distress levels of newly arrived refugees from Burma, Iraq, Bhutan/Nepal, Somalia, and the Democratic Republic of Congo. This qualitative data also served to ground, triangulate, and enhance the trustworthiness of study findings.

Although the quantitative outcomes were given priority, both the quantitative and qualitative strands served essential roles in the project. The quantitative results provided evidence of statistically significant differences in distress between each of the ethnocultural groups. Qualitative findings provided rich, contextual insights about related stressors in the current home environments of newly arrived refugees as well as their pre

and post arrival experiences. In this following section, quantitative and qualitative findings are merged, and subsequently compared and contrasted to further support findings or uncover conflicting evidence. The integration of quantitative and qualitative approaches provided credibility of findings through triangulation and thick description (Creswell & Plano Clark, 2012; Lee & Greene, 2007; Patton, 2012). Quantitative and qualitative findings will also be discussed in relation to the research questions, and compared to past and current literature in the field of refugee mental health. Finally, the limitations of the project will be discussed with the respect to secondary data, design, sample size, and generalizability of findings.

Integration of Quantitative and Qualitative Findings

Results from the three-way factorial analysis of variance revealed statistically significant differences in the distress levels between ethnocultural groups. On average, newly arrived refugees from Iraq were found to have the highest levels of distress (Mean = 19.86), followed by refugees from the Democratic Republic of Congo (16.04), Bhutan/Nepal (14.93), Burma (11.46), and Somalia (11.23). Several themes surfaced in the qualitative analyses in regards to home environment, pre-arrival experiences, and post arrival circumstances of newly arrived refugees. These themes provided clarity to better understand the significant differences in distress indicated in the quantitative findings. A joint display of merged quantitative and qualitative findings are displayed in the following table.

Table 15. Joint display of merged quantitative and qualitative findings by theme.

<i>Safety & Stability</i>	<i>Nature of Trauma Endured</i>
<p>Quant</p> <ul style="list-style-type: none"> ▪ Statistically significant mean differences in distress levels found between treatment group. 	<p>Quant</p> <ul style="list-style-type: none"> ▪ Statistically significant mean differences in distress levels found between ethnocultural background.
<p>Qual</p> <ul style="list-style-type: none"> ▪ Refugees with higher distress described uncomfortable living situations; whereas, refugees with lower distress reported they were comfortable in their home. <ul style="list-style-type: none"> ▪ 48.8% of refugees reported they were uncomfortable in their homes. ▪ 38.8% of refugees conveyed they were comfortable in their homes. ▪ Refugees with higher distress explained they felt unsafe in their home environment; however, refugees with lower distress expressed feeling safe in their homes. <ul style="list-style-type: none"> ▪ 60.8% of refugees reported feeling safe in their homes. ▪ 27.5% of refugees described being afraid or feeling unsafe in their homes. ▪ Refugees with higher distress reported temporary housing situations. ▪ Refugees with higher distress described not having enough privacy or space in home environment. 	<p>Qual</p> <ul style="list-style-type: none"> ▪ Iraqi, Congolese & Somali described clear understanding of why they fled. <ul style="list-style-type: none"> ▪ 87.5% of Iraqi refugees described targeted attacks on themselves and their families, bombings, and terrorist activity as the reasons that led to their migration. ▪ 62.5% of Somali refugees explained they had spouses or family members killed in the war. ▪ 45.7% of Congolese refugees described experiencing sexual violence or rape (personally or a family member). ▪ Refugees from Bhutan/Nepal and Burma described fleeing at a young age or prolonged time spent in camps. 50.0% of Bhutanese refugees and 12.1% of refugees from Burma did not know why their families originally fled Bhutan. ▪ Refugees described poor migration or camp conditions prior to arrival. <ul style="list-style-type: none"> ▪ 67.7% of Congolese refugees described having no food, no financial resources or work opportunities. ▪ 87.5% of Somali refugees conveyed there were many problems with food rations, utilities, and availability of health care. ▪ 91.4% of Iraqi refugees explained life was very hard before resettlement due to ongoing discrimination, family conflict, and lack of food or utilities. ▪ 74.7% of refugees from Burma described no education, inadequate food rations, and poor healthcare in the camps. ▪ 77.3% of Bhutanese refugees stated food rations were scarce, and things were chaotic and difficult before arrival.
<i>Resettlement Barriers</i>	<i>Social Support</i>
<p>Quant</p> <ul style="list-style-type: none"> ▪ Statistically significant mean differences in distress levels found between ethnocultural backgrounds within treatment group. ▪ Imbalances found in employment, household income, and English skills between ethnocultural group at each time point. 	<p>Quant</p> <ul style="list-style-type: none"> ▪ Statistically significant mean differences in distress levels found between ethnocultural backgrounds within treatment group. ▪ Imbalances family in camp or country of origin at each time point.

<p>Qual</p> <ul style="list-style-type: none"> ▪ Refugees with higher distress levels reported chronic health issues and pain. <ul style="list-style-type: none"> ▪ 62.1% of Congolese refugees described a debilitating medical condition or severe body pain. ▪ 45.5% of refugees from Burma reported chronic health conditions. ▪ 37.5% of Iraqi refugees described chronic pain and health conditions. ▪ 9.1% of Bhutanese refugees reported health issues. ▪ Refugees with lower distress had found employment; whereas, higher distress was described by refugees who were unemployed. <ul style="list-style-type: none"> ▪ 59.1% of Bhutanese refugees stated they were unemployed ▪ 80.0% of Congolese refugees reported being unemployed. ▪ 40.0% of Iraqi refugees stating they were happy to be working, and the job(s) were helping with their adjustment. ▪ Refugees with higher distress described barriers in English language and cultural knowledge. <ul style="list-style-type: none"> ▪ 67.5% of Iraqi refugees conveyed they were lacking English skills. ▪ 81.3% of Somali refugees described difficulties in daily life because of no English skills and low cultural knowledge. ▪ 79.3% of Congolese refugees explained they do not have English language skills, and are afraid they will fail to learn at ESL. ▪ Refugees with higher distress had lower monthly income. <ul style="list-style-type: none"> ▪ 50.0% of Bhutanese refugees reported economic burdens. ▪ 43.4% of refugees from Burma described economic burdens. 	<p>Qual</p> <ul style="list-style-type: none"> ▪ Refugees with higher distress reported lack of family or friends in the area. <ul style="list-style-type: none"> ▪ 37.5% of Iraqi refugees worry about family still in Iraq or in migration. Iraqi refugees conveyed fear and distress about family & loved ones still in conflict zones. ▪ 44.8% of Congolese refugees stated being away from family made resettlement difficult. ▪ 50.0% of Somali refugees conveyed they needed social support. ▪ 47.7% of refugees from Burma described things are tough because no family or friends here. ▪ 57.1% of Bhutanese refugees described a lack of social support or community has made life hard here. ▪ Refugees with lower distress reported they lived with family or close friends. <ul style="list-style-type: none"> ▪ 100.0% of Bhutanese refugees who stated they are happy explained that they live or have family in Denver. ▪ 63.3% of refugees from Burma who conveyed they were doing well have family or close friends in Denver. ▪ 80.0% of Iraqi refugees who stated they like it here and life is beautiful here have family with them in Denver. ▪ 50.0% of Somali and Congolese refugees who described themselves as doing good or fine, conveyed they had family or close friends nearby in Denver.
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First, the newly arrived refugee groups with the highest distress levels during early resettlement (that is, refugees from Iraq and the DRC) described constant mobility prior to resettlement in Colorado. Rather than fleeing to organized refugee camps, Iraqis had been living in unplanned camps or self-settled in urban areas of neighboring host countries. Similarly, many of the refugees from the DRC sought shelter in makeshift or temporary camps in nearby Great Lakes and Southern African nations. As a result, the

majority of Iraqis and Congolese refugees had no legal status as well as restricted rights to employment, education, freedom of movement, and access to health care prior to resettlement. Moreover, 100.0% of Iraqi refugees and 65.7% of Congolese refugees had fled their countries of origin within the past decade.

In comparison, refugees from Bhutan/Nepal, Burma, and Somalia reported protracted situations in planned camps managed by the UNHCR. For example, Bhutanese refugees had been living in organized refugee camps in Nepal for on average of 18.5 years. Although poor access to basic needs such as food, water, electricity, and heat were described by each ethnocultural group of newly arrived refugees, it is possible that enduring these circumstances in a long-term, relatively stable context led to lower distress upon resettlement in Colorado.

Second, qualitative findings revealed differences in the types of trauma faced by each ethnocultural group prior to arrival. In addition, qualitative findings revealed nuances in newly arrived refugees' understanding about events that led to fleeing their countries of origin. Iraqi, Congolese and Somali refugees conveyed a clear understanding of why they had fled their homes, sharing experiences that ranged from direct threats and harassment from armed militia to sexual assault and rape to family members kidnapped and killed by terrorist groups. A sub-set of refugees from Bhutan/Nepal and Burma, however, voiced that they either fled at a young age or were born in organized refugee camps in Nepal or on the Thai border. Consequently, nearly a quarter of refugees from Bhutan/Nepal and Burma expressed that their families had not explained why they had

fled years ago. While the living conditions were often dire in the camps, refugees who had not experienced fleeing their homes within the past decade or their lifetime reported lower distress levels on average.

The quantitative results also indicated that newly arrived refugees in each ethnocultural background that presented with high or low levels of distress demonstrate distinct patterns over the course of the resettlement. Refugees from Burma with high distress levels of distress at arrival sustained high distress through 9 months, then decreased slightly when approaching a year of resettlement. Alternatively, refugees from Burma with low levels of distress at arrival maintained low distress through the first year of resettlement.

A parallel pattern in distress during early resettlement was found for Bhutanese refugees with high and low distress levels at arrival. Distress initially declined from 3 to 6 months, then slightly increased for next 6 months. Iraqi refugees with high distress levels at arrival showed steady increases in distress at each time point through 12 months of resettlement; whereas, Iraqi refugees who reported low levels of distress at arrival maintained this level of distress through 9 months, then slightly decreased when approaching a year of resettlement.

For Congolese refugees with high levels of distress at arrival, an initial steep increase in distress was found from 3 to 6 months before declining for the next 6 months, and returning to baseline distress level. Congolese refugees with low levels of distress at arrival, however, maintained low levels across the entire first year of resettlement. Somali

refugees who reported high distress levels at arrival exhibited steady increases in distress at each time point; whereas Somali refugees with low distress levels at arrival demonstrated a slight decline from 3 to 6 months, then increased back to baseline levels of distress at 12 months of resettlement.

Qualitative interviews were conducted at the same time as the administration of baseline RHS-15 screenings. Therefore, refugees' perceptions of their post-arrival livelihoods and home environments provided insight into daily stressors that may contribute to heightened distress early in resettlement. Additionally, newly arrived refugees described a number of factors that played a supportive role in their adjustment during early resettlement.

In the interviews, Iraqi refugees reported a lower proportion of safety with their housing in comparison to refugees from Bhutan/Nepal, Burma, Somalia and the DRC. These concerns were often explained by Iraqi refugees as related to neighborhood dangers, loud noises and fighting in apartment complex or homes, and fears that police presence would lead to threats or arrests. Although these concerns were also discussed by Congolese and Somali refugees, they were not mentioned as consistently as by Iraqi refugees. Chronic pain and health conditions were described most frequently by Iraqi and Congolese refugees, which may expound on why these two ethnocultural groups had higher levels of distress on average at arrival than refugees from Bhutan/Nepal, Burma, and Somalia.

Newly arrived refugees' descriptions of post-arrival experiences also served to augment understanding of the differences in the levels of distress found between ethnocultural backgrounds during early resettlement. Challenges with transportation, acquiring English language and cultural knowledge, safety and stability, housing, health, and social support emerged as themes related to distress in early resettlement. While a subset of every ethnocultural group discussed challenges with learning English, Congolese refugees conveyed the highest proportion of difficulty learning English language. In turn, refugees described how their lack of English and cultural knowledge limited their use of transportation and services, obtaining education and jobs, and engagement with neighbors in their communities.

Social bonds with family and close friends surfaced in the qualitative findings as critical source of support and assistance in early resettlement. Overall, refugees who stated they had family living in Denver were more likely also describe their home environments as comfortable and safe. Likewise, refugees with a local network of family and friends expressed that it aided their adjustment to new surroundings, navigation of transportation, social and health services, as well as developing English language skills and cultural knowledge.

In contrast, a lack of social support emerged as an impeding factor in refugees' ability to adjust. Newly arrived refugees who shared they did not have family or close friends in Denver metro also frequently described their home environments as uncomfortable, and reported a higher proportion of barriers to employment, accessing

services, and learning English. Further, refugees lacking social support in early resettlement reported greater perceived safety concerns in their home and neighborhoods. Although family served as a link for connecting newly arrived refugees with ESL courses, refugees without family in Denver expressed fears about the inability to learn English.

Moreover, refugees from Iraq, the DRC, and Burma expressed a higher rate of physical health conditions and chronic pain resulting from harm or torture experiences prior to flight than refugees from Bhutan/Nepal and Somalia. Exacerbated by prolonged stressors related to lack of adequate food, clean water, utilities, and safety during migration, chronic health conditions and body pain were often described as debilitating to adjustment in early resettlement. Specifically, health conditions and chronic pain were described in relation to the following challenges: finding employment and economic stability, building relationships with neighbors in their community, sleeping problems, and mobility in home environment, especially if the home had stairs.

An original purpose of the study was also to explore potential changes in the distress of newly arrived refugees over time in early resettlement. Due to the structure and sample size of the RHS-15 screening data, the inferential analysis examined time as a between subjects factor rather than a within subjects factor. Furthermore, there was no statistically significant interaction found between treatment group and time, or ethnocultural background and time. This was a relatively surprising result, as emergent literature has indicated heterogeneity in the psychological distress trends of resettled

refugees over time (Bieser, 1998; Tran, Manalo & Nguyen, 2007). Namely, Beiser (1988) found depression symptoms of refugees tended to fluctuate over the first two years of resettlement with peak levels around 10-12 months. Long-term follow up studies have supported similar findings. For example, Westermeyer & Wahmanholm (1989) and Beiser & Hou (2001) demonstrated gradual improvements in psychological symptoms for the majority of refugees over the course of ten years of resettlement.

Different results were found for time as a main effect, pre and post propensity score analysis. Thus, it became apparent that time-varying covariates influenced the estimation of true treatment effects between treatment and control groups. This finding underscored the importance of balancing treatment conditions prior to performing inferential analyses in order to make sound conclusions about treatment differences between groups (Guo & Fraser, 2015; Austin, 2010; Rubin & Rosenbaum, 1983).

Trustworthiness of Findings

The utilization of two methodologies in the project expanded the credibility and confirmability of findings. Specifically, a rich and robust description of each theme was provided to enhance the reader's comprehension of the findings gleaned from clinical interviews. In addition, the collection and analyses of quantitative and qualitative data offered the ability to assess consistency across the findings generated in both strands (Lincoln & Guba, 1985). That is, triangulation of findings from both strands facilitated a deeper understanding than either strand individually could have supported (Patton, 1999).

Trustworthiness was also enhanced through routine meetings with CoRWC staff, including the director, lead research psychologist, and research assistant. Here, multiple perspectives were shared in critique of the emergent findings in relations to their lived experiences caring for and supporting newly arrived refugees. The CoRWC staff's perspectives were then utilized to refine results and interpretation in order to augment understanding and application of findings in practice (Lincoln & Guba, 1985; Creswell & Plano-Clark, 2012).

This form of peer debriefing also facilitated reflexive dialogue among myself and CoRWC staff about the progress of the research and provided context to ground decisions. A benefit of utilizing secondary data may be that the researcher's objectivity is less impacted by prolonged engagement and persistent observation in the field. Nonetheless, the selection of the topic, research questions, study design, and pertinent findings were affected by the reflexivity and subjectivity that I, as the researcher, brought to the project. In the past fifteen years, I have been immersed in research and fieldwork with refugee and asylum seeker populations, domestic and abroad. The desire to use my position of power and privilege to empower and improve the livelihood of marginalized individuals is the driving force in my work. Therefore, constructed knowledge in this project was inevitably impacted by my worldview, preconceptions, political convictions, which have evolved as a result of my lived experiences working with refugees.

From a community-based participatory research perspective, advocacy and community education is an essential application of results (Israel et al., 2004; Strand et

al., 2000). In practice, integrating qualitative and quantitative methods simultaneously allowed me to endorse a pluralistic stance when conducting research on this project. Finally, subscribing to both the participatory and pragmatic worldviews enhanced my ability as a researcher to bring practical solutions and represent the voices of vulnerable individuals who are often overlooked by society.

Limitations of the Study

The present study contains several limitations. First, secondary data was used in both the qualitative and quantitative strand. Although this allowed for greater efficiency in the project, it potentially restricted the quality of the data collected as well as my proximity to its content. This is particularly the case for the qualitative clinical interviews. During the analyses, there were multiple points in which I wished I would of had the opportunity to probe an idea or train of thought shared by a refugee to gather more in depth description. Cultural barriers in communication and rapport with providers may have also limited the richness of data collected in interviews, thus eluding the true essence of refugees' experiences. The primary focus was to complete a brief assessment of pre and post arrival circumstances; therefore, less attention was given to exploring the concepts in greater detail.

Second, the sample size and design of data collection restricted the power and sophistication of the quantitative analysis. Due to limited financial and human resources, the follow up screenings were collected exclusively with refugees who met the criterion for positive distress within 30 days of arrival to Colorado. Therefore, investigation of

within person change, between person differences in within person change, and the functional shape of the distress during early resettlement in newly arrived refugees who screened positive in comparison to those who screened negative was not feasible.

Furthermore, the sample size among each ethnocultural background reduced the impact of propensity score matching techniques (nearest neighbor 1:1, nearest neighbor 1:2, and Mahalanobis distance) on balancing time-varying covariates at each of the four time points. This was particularly problematic for time point 3 (9 months) and time point 4 (12 months), as imbalanced in treatment groups remained due to a lack of suitable pairs in each time varying covariate. Consequently, the statistically significant differences in treatment effects between ethnocultural background found in the three-way factorial anova may have still been influenced by covariate imbalances that remained in treatment conditions. Additionally, differences in time-varying covariates or related characteristics that were not accounted for in the propensity score analysis may have influenced the quantitative results (Guo & Fraser, 2015; Lu et al., 2005). Recruitment of refugees suffered a higher attrition rate at 9 and 12 months due to frequent changes in contact information, location, and schedules, which reduced the sample size at these later time points. Nonetheless, the opportunity to evaluate screening outcomes collected over time with multiple ethnocultural groups of newly arrived refugees is a rare opportunity. Thus, it remained a worthwhile endeavor despite these methodological limitations.

Third, the study findings extend only newly arrived refugees from Bhutan/Nepal, Burma, Iraq, Somalia, and the DRC. If replicated with newly arrived refugees from ethnocultural backgrounds different from those included in this project, results would

likely vary. The findings of this study were supported by a small but growing body of literature, however, which posits that due to cultural differences in presentation and understanding of emotional distress, mental health symptoms will vary across ethnicity (Kohrt et al., 2014; Shannon et al., 2015; Chung & Bemak, 2002). The project took place in an urban metropolitan area of the Rocky Mountain Region, which restricts the potential application of findings beyond the region due to the resettlement processes and systems utilized in Colorado. Nevertheless, health providers and resettlement agencies throughout the United States and other Western nations may find that the project's findings resonant with newly arrived refugee populations they serve, as the qualitative findings are grounded in the Indicators of Integration conceptual framework that was developed with resettled refugees in the United Kingdom (Ager & Strang, 2004).

Part 2: Implications and Recommendations

“One could not cross a bridge constructed by oneself.”

Whatever you do, do it properly, so it is of use. – Bhutanese Proverb

The present study was a community-based participatory research project that employed mixed methods to explore potential differences in the distress levels of newly arrived refugees during the first year of resettlement. In tandem, the study sought to examine the impact of propensity score analysis with three matching techniques on balancing time-varying covariates among treatment groups.

This was an important area of inquiry in refugee mental health as experimental designs have been rarely employed due to limited resources, ethical consequences, and the instable and uncertain nature of treatment with newly arrived refugee populations. In circumstances where random assignment is not possible, statistical techniques such as propensity score analysis can be used ad hoc to control for imbalances in related demographic variables that may lead to inaccurate conclusions about treatment effects of an intervention. Moreover, it is advisable for propensity score analysis to be utilized even in instances where random assignment has been implemented, as differences in demographic characteristics may remain between treatment conditions (Guo & Fraser, 2015; Austin, 2009; King et al., 2011).

Several recommendations for research methods and statistics, practice, resettlement, and communities arose from this project, which are presented in Table ____ below. In the following section, the recommendations are shared at length for each target audience with a critical focus on applying practical solutions. By imparting these recommendations, I hope to elevate the rigor of future research and evaluation conducted with newly arrived refugees as well as promote advocacy and change-oriented community education to improve the livelihoods of a resilient population who are often disregarded in society.

Table 16. Recommendations for Research, Practice, Resettlement and Communities.

Research Methods & Statistics	Health Practitioners
<ul style="list-style-type: none"> ▪ Plan longitudinal studies to examine distress over span of 5+ years ▪ Design experimental studies for higher quality data, rigor, and control. ▪ Utilize propensity score analysis with matching techniques may be an effective approach in the absence of experimental design. ▪ Nearest neighbor 1:2 may perform best over time with small sample sizes in each cohort. ▪ Employ mixed methodology to better address multi-dimensional aspects of refugee mental health. 	<ul style="list-style-type: none"> ▪ Develop group interventions that target familial and collective effects of violence and trauma, in addition to individual effects. ▪ Offer culturally grounded interventions specialized to particular ethnocultural groups, incorporating facilitators that have expertise in or are of the same ethnocultural background. ▪ Integrate health, mental health, and social services to address underlying causes of distress in a holistic manner.
Resettlement Agencies	Communities & Neighbors
<ul style="list-style-type: none"> ▪ Offer employment briefings, English language and cultural training, in pre-arrival orientation ▪ Link new arrivals to cultural and English language resources in pre-arrival orientation ▪ Create individualized employment plans ▪ Develop job and ESL mentoring teams to connect new arrivals with successfully integrated refugees. 	<ul style="list-style-type: none"> ▪ Promote cultural events to generate greater awareness of history and culture of refugee groups. ▪ Organize open dialogue forums with trained facilitators who can guide conversations neutrally. Include representation from refugee community leaders as topical experts. ▪ Develop joint community projects around concrete tasks or areas of mutual interest and expertise for newly arrived refugees and locals.

Recommendations for Research Methods & Statistics

Although extensive research has been conducted to investigate the mental health of refugee populations during resettlement, the vast majority of these studies have been observational in nature. In the absence of experimental designs, researchers and practitioners may come to inaccurate conclusions about treatment effects of interventions, or levels of mental health symptoms. The present study demonstrated this by examining potential differences in distress levels between treatment groups, ethnocultural groups, and time before and after matching to determine whether balancing time-varying covariates in treatment and control group had an impact on treatment effects.

Future studies using longitudinal design are critical to systematically capture individual change throughout the first year of resettlement and beyond. There is also an urgent gap in the field to employ experimental design in well-contextualized, community-based environments. There are substantial ethical and logistical challenges, which often deter researchers and practitioners from employing randomized control trials with vulnerable populations (Block et al., 2012; Bhutta, 2004; Esses et al., 2008; Pope, 2015). Conversely, making treatment decisions based on observational or cross-sectional studies may expose patients to ineffective treatments and possibly put their health and wellbeing at risk.

In instances when experimental designs have not been employed or have been breached, statistical methods such as propensity score analysis may be an appropriate technique to control for confounding differences in covariates between treatment groups. The matching techniques in the study demonstrated improvements in the balance among treatment groups, albeit somewhat limited due to sample size. In these conditions, nearest neighbor 1:2 performed superior at every time point in balancing time-varying covariates between treatment groups. Therefore, it is recommended that researchers and evaluators utilize the nearest neighbor 1:2 technique when dealing with restricted sample sizes.

Finally, despite the fact that mixed methodology has been touted in recent literature as the best practice when conducting research with refugee populations, few studies have implemented this approach to date (Weine et al., 2014). The strength of

utilizing this pluralistic approach is that it enables the researcher to be responsive to and flexible in examining the central research problem at hand. Researchers and evaluators should embrace multiplicity in their methodology when designing future research in order to better address refugee mental health; a multi-dimensional discipline that requires a multi-temporal, multi-level, and multi-perspective approach.

Beyond future research directions, the following sections address improvements that can be made by health practitioners to serve newly arrived refugees more effectively.

Recommendations for Health Practitioners

The findings in this study extend to health and mental health practitioners alike in two main aspects: screening and treatment modalities. Increasingly, primary care providers administer the RHS-15 with newly arrived refugees within 30 days of arrival. Given the findings indicated in the study, refugees may present with differing levels or presentations of distress at arrival. As such, training on culturally-specific expressions of mental health is needed to build rapport and understand the nuanced ways in which refugees may reveal their distress. Given the time and resource restrictions facing health providers, this is a daunting task.

At arrival, RHS-15 outcomes found newly arrived refugees from Iraq reported the highest level of emotional distress followed by refugees from the DRC. Newly arrived refugees from Bhutan/Nepal, Burma and Somalia, however, endorsed lower levels of distress within the first 30 days of resettlement. These ethnocultural differences in distress were statistically significant. Qualitative findings revealed newly arrived refugees

with higher distress in early resettlement reported lower monthly incomes, higher unemployment, unstable and uncomfortable housing, greater cultural and English language barriers, chronic health issues/pain and disabilities, and poor access to social support from family and friends. In contrast, newly arrived refugees with lower distress described living in comfortable and safe home environments with family and friends, stronger English skills and cultural knowledge, and greater job prospects or employment.

Interpreted together, the quantitative and qualitative findings in the study highlight the need for screening tools to assess factors related to safety and stability in newly arrived refugees, such as access to basic needs, English skills, employment readiness, and social support, as these were found to explain differences in distress levels across the first year of resettlement. Future research should develop screening items that are grounded in culturally specific expressions of distress, as the present study found ethnocultural background impacted newly arrived refugees' endorsement of distress symptoms (Kaiser et al., 2015; Korht et al., 2014; Shannon et al., 2015). In contexts when a normative criterion is unavailable, research has demonstrated the value of utilizing local informants to add external credibility and trustworthiness of assessment tools (Bolton, 2001).

In the context of persecution, mass violence, and war, trauma not only damages the individual identity, but also the collective identity (Craig et al., 2009; Kira et al., 2012; Hobnell et al., 2007). To this end, findings in this study found that family and close

friends acted as important social bonds and linkages to services; whereas, a lack of social support hindered adjustment in early resettlement. Findings also indicated stark differences in pre arrival traumas and migration experiences. With respect to treatment models, interventions should be inclusive and sensitive to the particular types of political and social violence that refugee individuals and ethnocultural groups as a whole have faced prior to and during fleeing their homes (Murray, Davidson & Schweitzer, 2014). Integrating mental health, social, and legal services may increase the capacity of primary health providers to accurately assess clinically significant distress as well as efficiently connect refugees with the specialized services they need.

Furthermore, the RHS-15 is focused entirely on gathering information on individualized emotional distress symptoms and functioning. In the future, reliable and culturally-attuned screening tools that take into account the familial and collective impacts of trauma are urgently needed for to inform service planning and delivery. Such measures would also assist practitioners and researchers alike in better understanding the far-reaching impacts of trauma from family systems and community based perspectives (Johnson-Agbakwu et al., 2014).

Prior research has established that individual-level interventions designed in the Western context of isolated traumas may be insufficient in addressing the impact of traumatic experiences at the family and community levels (Kira et al., 2012; Nickerson et al., 2010). Rather, it may be advantageous to implement family and community-based interventions that concentrate on rebuilding refugees' safety, stability, social connection

and support. In addition, the project confirmed newly arrived refugees often present with complex health and chronic pain that overlap with emotional and psychological symptoms. Interventions that weave physical, mental, and social health and education may promote greater wellbeing by addressing multiple underlying causes of distress concurrently (Berthold et al., 2014).

Resettlement agencies act as important gatekeepers early in the resettlement process, thus several key recommendations for connecting new arrivals with critical services and supports that will promote safety and stability are offered in the following section.

Recommendations for Resettlement/Voluntary Agencies

In this study, challenges with gaining employment and financial stability, and acquiring English language skills emerged as factors that contributed to distress and poor adjustment in newly arrived refugees during early resettlement. Additionally, social support was found to play an essential role in linking newly arrived refugees to core health and social services, transportation, and employment opportunities, and building English language and cultural knowledge. Bearing in mind these findings, voluntary agencies, or VOLAGs, may benefit from the following suggestions.

First, in effort to improve engagement and readiness for employment and English language classes, refugees should be briefed during pre-arrival orientation on job climate and potential obstacles to expect in the region they will be resettled in. Additionally, potential employers could engage in outreach and partnerships with agencies to generate

more direct paths to employment in early resettlement. By doing so, refugees will learn to better match their expectations to the realities they will face upon resettlement as well as gain an arsenal of advice and options to draw on when their job search begins. A second suggestion is for agency staff to develop individualized employment plans to assist newly arrived refugees in planning for and being realistic about sequence of steps that will be necessary to achieve employment goals. Third, agencies should work alongside resettled refugees communities to develop support groups that connect newly arrived individuals with resettled refugees from their respective ethnocultural backgrounds who have successfully found employment and integrated into their communities. This approach would offer structure and social support to refugees as they face the overwhelming task of learning a novel set of norms and systems upon arrival.

The study's findings confirmed that within each ethnocultural group, unique barriers and cultural norms and linguistic considerations exist. A recently completed five-year study, Refugee Integration and Survey Evaluation (RISE), conducted by Quality Evaluation Designs (QED) in collaboration with the Colorado Refugee Services Program (CRSP) found that employment and economic sufficiency, social bonding, language and cultural knowledge were critical indicators of successful integration. In comparison, low scores on housing and social bonding and high scores on health and physical wellbeing were indicators of integration distress (Lichtenstein, Puma, Engelman & Miller, 2016). Correspondingly, improved linkage to cultural and English language resources may augment newly arrived refugees' ability to thrive in early resettlement. In particular, a mentor system may be beneficial to building confidence and practicing speaking English

regularly. It may also provide new arrivals with greater support to persevere through frustrating and disorienting situations during the learning process.

In addition to VOLAGS, community members play an instrumental role in welcoming newly arrived refugees. Several considerations for neighbors and local residents who are consciously (or unconsciously) engaged in receiving refugees into their communities are provided in the following section.

Recommendations for Receiving Communities and Neighbors

Newly arrived refugees from each ethnocultural background voiced difficulties connecting with neighbors during early resettlement. Although substantial support and assistance is provided for the first few months of resettlement, community members can play a pivotal role in aiding integration over time. Some refugees explained that individuals in the community tended to keep to themselves or did not seem overtly friendly, while others have been directly dismissive and angry about their presence in the neighborhood. In every community, there are residents who certainly extend kindness and support to newly arrived refugees and their families, and there are others who do not display the same receptivity.

These tensions may continue to escalate when driven by fear, hostility, and prejudice. Despite the presence of aggression and animosity, it is possible to minimize such tensions between resettled refugees and locals by cultivating outlets for positive, healthy relationships and bridging ethnic divisions. Subsequently, three suggestions for receiving communities and neighbors, alike, are offered below.

A first suggestion is for receiving communities to design cultural events and activities around strengthening meaningful connection between newcomers and receiving community members. Traditionally, festivals have been held to celebrate, honor, and promote greater awareness of particular ethnocultural backgrounds in a community. Incorporating performing and visual arts may serve to deepen empathy in residents around the issues of demographic and social changes within a community. While such events typically draw crowds, most of the attendees will already have interest and openness to connecting with another culture. Nonetheless, it may be to positive approach to begin with if a community has minimal experience with diversity.

Secondly, open dialogues provide purposeful opportunities to discuss different uncertainties and opinions in a supportive environment. Dialogues should incorporate a range of perspectives and voices to avoid polarization of one or more groups. It is important to invite the participation of refugees in person (e.g. door to door or through personalized invitations via volags, schools, places of worship, community centers, etc.) rather than through emails or mailings. Within these settings, it is also imperative to utilize trained facilitators to minimize the perception of professional or personal agendas guiding the discussion. Structuring open dialogues in a series may also foster follow up conversation and strengthen ongoing connections between receiving community members and refugees.

A final recommendation for receiving communities is to develop joint community projects within neighborhoods. In doing so, it is beneficial to create projects around a concrete task or mutual interest for refugees and their neighbors, such as community

gardening, crisis response or emergency disaster preparedness trainings, sewing and crafting, citizenship mentoring, parenting, cooking classes, and computer tutoring. Moreover, it is critical to create leadership and training roles for refugees to be perceived as experts within such projects in order to emphasize equal power and avoid fostering the continuation of colonial ideas. The endeavors, then, have greater potential to serve as transformative and bonding experiences for both refugees and receiving community members.

Closing Remarks

Although mental health distress among newly arrived refugees is well documented in research, a dearth of knowledge remains in understanding whether distress levels may change over time, how distress may vary among specific ethnocultural groups, and what factors may contribute to ethnocultural variability in distress. This study contributed substantially to the field in three ways: 1) expanding the use of mixed methodology to study the mental health of newly arrived refugees, 2) exploring differences in distress between refugees from Bhutan/Nepal, Burma, Iraq, Somalia, and the Democratic Republic of Congo, and 3) applying propensity score analysis to balance time-varying covariates at each time point in order to more accurately estimate true treatment effects between treatment conditions, ethnocultural group, and time. The application of these findings to five ethnocultural backgrounds provided quantitative and qualitative support to what has been previously posited in refugee mental health literature, and offered future directions for four distinct audiences in research methods and statistics, health practice, refugee resettlement, and community development.

References

- Ager, A. & Strang, A. (2004). Indicators of Integration: A Home Office Development and Practice Report. *Research, Development, and Statistics Directorate*, 1-26.
- Ager, A. and Strang, A. (2008). Understanding integration: a conceptual framework. *Journal of Refugee Studies*, 21(2), 166-191.
- Ahearn, F. L. (2000). *The psychosocial wellness of refugees: Issues in qualitative and quantitative research*. Oxford, UK: Berghahn Books.
- Ai, A., Peterson, C., & Uebelhor, D. (2002). War-related trauma and symptoms of posttraumatic stress disorder among adult kosovar refugees. *Journal of Traumatic Stress* 15(2): 157-160.
- Ao, T., Taylor, E., Lankau, E., Sivilli, T. I., Blanton, C., Shetty, S., Lopes-Cardozo, B., Cochran, J., Ellis, H., & Geltman, P. (2012). An investigation into suicides among Bhutanese refugees in the United States: A stakeholder's report. *Center for Disease Control and Prevention*, 1-24.
- Apel, R., Blokland, A. J., Nieuwbeerta, P., & van Schellen, M. (2010). The impact of imprisonment on marriage and divorce: A risk set matching approach. *Journal of Quantitative Criminology*, 26, 269-300.
- Austin, P.C. (2009). The relative ability of different propensity-score methods to balance measured covariates between treated and untreated subjects in observational studies. *Medical Decision Making*, 29, 661-677.

- Austin, P.C. (2009). Using the standardized difference to compare the prevalence of a binary variable between two groups in observational research. *Communications in Statistics— Simulation and Computation*, 38, 1228–1234.
- Austin, P.C. (2010). Balance diagnostics for comparing the distribution of baseline covariates between treatment groups in propensity-score matched samples. *Statistics in Medicine*, 28, 3083–3107.
- Balcazar, F., Taylor, R., Kielhofner, G., Tamley, K., Benziger, T., Carlin, N., Johnson, S. Participatory action research: General principles and a study with a chronic health condition. In: Jason LA, Keys CB, Suarez-Balcazar Y, Taylor RR, Davis MI, editors. (2004). *Participatory Community Research: Theories and Methods in Action*. APA; Washington, D.C.
- Banks, S., Armstrong, A., Carter, K., Graham, H., Hayward, P., Henry, A., Holland, T., Holmes, C., Lee, A., McNulty, A., Moore, N., Nayling, N., Stokoe, A., Strachan, A. (2013). Everyday ethics in community-based participatory research. *Journal of the Academy of the Social Sciences*, 8(3), 263-277.
- Bass, J. K., Annan, J., McIvor-Murray, S., Kaysen, D., Griffiths, S., Cetinoglu, T., Wachter, K., Murray, L. K., & Bolton, M. (2013). Controlled trial of psychotherapy for Congolese survivors of sexual violence. *New England Journal of Medicine*, 23, 2182-2191.
- Bhatia, R. & Wallace, P. (2007). Experiences of refugees and asylum seekers in general practice: A qualitative study. *Journal of Family Practice*, 8(48), 1-16.

- Bhugra, D. & Becker, D. (2005). Migration, cultural bereavement, and cultural identity. *World Psychiatry*, 4(1), 18-24.
- Bhui, K., Mohamud, S., Warfa, N., Craig, T., & Stansfeld, S. (2003). Cultural adaptation of mental health measures: Improving the quality of clinical practice and research. *BJ Psych*, 183, 184–186.
- Beiser, M. (1998). Influences of time, ethnicity, and attachment on depression in Southeast Asian refugees. *American Journal of Psychiatry*, 145(1), 46–51.
- Beiser, M. & Hou, F. (2001). Language acquisition, unemployment, and depressive disorder among Southeast Asian refugees: a 10-year study. *Journal of Social Science Medicine*, 53(10), 1321-1334.
- Block, K., Warr, D., Gibbs, L., & Riggs, E. (2012). Addressing ethical and methodological challenges in research with refugee-background young people: Reflections from the field. *Journal of Refugee Studies*, 26(1), 69-87.
- Boynton, L., Bentley, J., Jackson, J.C., & Gibbs., T. A. (2010). The role of stigma and state in the mental health of Somalis. *Journal of Psychiatry Practice*, 16(4), 265-268.
- Colic-Peisker, V. & Walker, I. (2003). Human capital, acculturation and social identity: Bosnian refugees in Australia. *Journal of Community and Applied Social Psychology*, 13(5), 337-260.
- Craig, T., Jajua, P., & Warfa, N. (2009). Mental health care needs of refugees. *Journal of Psychiatry*, 5, 405– 408.

- Creswell, J. W. & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- De Jong, J. T., & Reis, R. (2010). Kiyang-yang, a West-African postwar idiom of distress. *Journal of Cultural, Medicine, and Psychiatry*, 34(2), 301-324.
- Denham, S. A., Caal, S., Bassett, H. H., Benga, O. & Geangu, E. (2004). Listening to parents: Cultural variations in the meaning of emotions and emotion socialization. *Cognitie Creier Comportament*, 8, 321-350.
- Doná, G. (2007). The microphysics of participation in refugee research. *Journal of Refugee Studies*, 20(2), 210-229.
- Ellis, B. H., Kia-Keating, M., Yusuf, S. A., Lincoln, A. and Nur, A. (2007) Ethical research in refugee communities and the use of community participatory methods. *Transcultural Psychiatry*, 44(3), 459–481.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.
- Fazel, M., Wheeler, J., & Danesh, J. (2005). Prevalence of serious mental disorder in 7,000 refugees resettled in Western countries: A systematic review. *The Lancet*, 365(9467), 1309–1314.

- Fenta, H., Hyman, I., Rourke, S. B., Moon, M., & Noh, S. (2014). Somatic symptoms in a community sample of Ethiopian immigrants in Toronto, Canada. *International Journal of Cultural and Mental Health*, 3(1), 1-15.
- Fishman, E. (2014). Incident Diabetes and Mobility Limitations: Reducing Bias Through Risk-set Matching. *Journal of Gerontology*, 212-225.
- Foster, E. M. (2003). Propensity score matching: An illustrative analysis of dose response. *Journal of Medical Care*, 41(10), 1183–1192.
- Fuys, A. & Vines, S. (2010). Increasing Congolese arrivals: Insights for preparation. Refugee Council: Washington D. C.
- Garrido, M. M., Kelley, A. S., Paris, J., Roza, K., Meier, D. E., Morrison, R. S., & Aldridge, M. D. (2014). Methods for constructing and assessing propensity scores. *Journal of Health Services Research*, 49(5), 1701-1722.
- Gerritsen, A. M., Bramsen, I. & Deville, W. (2006). Physical and mental health of Afghan, Iranian and Somali asylum seekers and refugees living in the Netherlands. *Social Psychiatry and Psychiatric Epidemiology*, 41(1), 18–26.
- Goldstein, L. & Langholz, B. (1996). Risk set matching for epidemiologic cohort studies. *Journal of Statistical Science*, 11(1), 35-53.
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed methods evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3), 255-275.
- Griffin, B. A., Ridgeway, G., Morral, A. R., Burgette, L. F., Martin, C., Almirall, D., Ramchand, R., Jaycox, L. H., & McCaffrey D. F. (2014). Toolkit for Weighting

and Analysis of Nonequivalent Groups (TWANG) Website. Santa Monica, CA: RAND Corporation.

Guerin, P. B., Allotey, P., Hussein, E. F., & Baho, S. (2008). Advocacy as a means to assisting refugee women to take control of their reproductive health needs.

Journal of Women Health, 43(4), 7-25.

Guerin, P., & Guerin, B. (2007). Research with refugee communities: Going round in

circles with methodology. *The Australian Community Psychologist, 19*, 150-162.

Guo, S. & Fraser, M. W. (2015). Propensity score analysis: Statistical methods and

applications (2nd ed.). Sage Publications: Los Angeles, California.

Hinton, D. E., Lewis-Fernandez, R., Pollack, M. H. (2009). A model of the generation of

ataque de nervios: the role of fear of negative affect and fear of arousal

symptoms. *Journal of CNS Neuroscience and Therapeutics, 15*(3), 264-275.

Ho, D. E., Imai, K., King, G., & Stuart, E. A. (2011). MatchIt: Nonparametric

preprocessing for parametric causal inference. *Journal of Statistical Software,*

42(8), 1-28.

Hollifield, M., Warner, T., Lian, N., Krakow, B., Jenkins, J., Kesler, J., Stevenson, J., &

Westmeyer, J. (2002). Measuring trauma and health status in refugees: A critical

review. *Journal of the American Medical Association, 288*, 611–621.

Hollifield, M., Warner, T. D., Krakow, B., Jenkins, J., & Westermeyer, J. (2011). The

range of symptoms in refugees of war: The New Mexico Refugee Symptom

- Checklist-121. *Journal of Nervous and Mental Disease*, 197(2), 117-125.
- Hollifield, M., Verbillis-Kolp, S., Farmer, B., Toolson, E., Woldehaimanot, T., Yamazaki, J., Holland, A., St Clair, J., & SooHoo, J. (2013). The Refugee Health Screen-15 (RHS-15): development and validation of an instrument for anxiety, depression, and PTSD in refugees. *General Hospital Psychiatry*, 35, 202-209.
- Hugman, R., Pittaway, E. & Bartolomei, L. (2011). When 'Do No Harm' is not enough: The ethics of research with refugees and other vulnerable groups. *British Journal of Social Work*, 41, 1271-1287.
- Hughes, D. & DuMont, K. (1993). Using focus groups to facilitate culturally anchored research. *American Journal of Community Psychology*, 21(6), 775-806.
- Human Rights Watch (2012). Retrieved from <http://www.hrw.org/burma> on January 4, 2015.
- Israel, B. A., Eng, E., Schulz, A. J., Parker, E. A. (2005). *Methods in community-based participatory research for health*. San Francisco: Jossey-Bass.
- Israel, B.A., Schulz, A.J., Parker, E. A., Becker, A. B. (1998). Review of community-based research: assessing partnership approaches to improve public health. *Annual Review of Public Health*, 19, 173–202.
- Jamil, H., Farrag, M., Hakim-Larson, J., Kafaji, T., Abdulkhaleq, M., & Hammad, A. (2007). Mental health symptoms in Iraqi refugees: Posttraumatic stress, anxiety, and depression. *Journal of Cultural Diversity*, 14(1), 19-26.

- Jamil, H., Nassar-McMillan, S. C., & Lambert, R. G. (2007). Immigration and psychological sequelae: A comparison of three waves of Iraqi immigrants. *Journal of American Orthopsychiatry*, 77(2), 199-205.
- Jayawickreme, E., Jayawickreme, N., & Goonasekera, M.A. (2012). Using focus group methodology to adapt measurement scales and explore questions of wellbeing and mental health: The case of Sri Lanka. *Intervention: International Journal of Mental Health, Psychosocial Work and Counseling in Areas of Armed Conflict*, 10, 156-167.
- Johnson, C. E., Sagal, A. A., & Shipp, M. P. (2009). Building community-based participatory research partnerships with a Somali refugee community. *American Journal of Preventative Medicine*, 37(6), 230-236.
- Johnson, K., Scott, J., Rughita, B., Kisielewski, M., Asher, J., Ong, R., & Lawry, L. (2010). Association of sexual violence and human rights violations with physical and mental health in territories of the eastern Democratic Republic of the Congo. *Journal of American Medical Association*, 304(5), 553-562.
- Kaiser BN, Kohrt BA, Keys HM, Khoury NM, Hagaman AK, McLean KE, Wagenaar BH, Kramer M (2015). Scale properties of the Kreyòl Distress Idioms (KDI) screener: Association of an ethnographically-developed instrument with depression, anxiety, and sociocultural risk factors in rural Haiti. *International Journal of Culture and Mental Health*. 8(4), 341-358.

- Keppel, G. & Wickens, T. D. (2004). Design and analysis: A researcher's handbook (4th ed.). Pearson: Boston, MA.
- Kirmayer, L. J., & Young, A. (1998). Culture and somatization: Clinical, epidemiological, and ethnographic perspectives. *Journal of Psychosomatic Medicine, 60*, 420–430.
- Kirmayer, L.J., (2005). Culture, context and experience in psychiatric diagnosis. *Psychopathology, 38*, 192–196.
- Kohrt, B. A., Hruschka, D. J. (2010). Nepali concepts of psychological trauma: The role of idioms of distress, ethnopsychology and ethnophysiology in alleviating suffering and preventing stigma. *Journal of Culture, Medicine, and Psychiatry, 34*(2), 322-352.
- Laban, C. J., Gernaat, H. B., Komproe, I. H., Schreuders, B. A., & De Jong, J. T. (2004). Impact of a long asylum procedure on the prevalence of psychiatric disorders in Iraqi asylum seekers in the Netherlands. *The Journal of Nervous and Mental Disease, 192*, 843–851.
- Lanjouw, S., Bamforth, V., & Mortimer, G. (2000). Internal displacement in Burma. *Journal of Disasters, 24*(3), 228-239.
- Lewis-Fernandez, R., Gorritz, M., Raggio, G. A., Pelaez, C., Chen, H., Guarnaccia, P. J. (2010). Association of trauma-related disorders and dissociation with four idioms of distress among Latino psychiatric outpatients. *Journal of Culture, Medicine,*

- and Psychiatry, 34, 219–243.*
- Li, Y. (1999). Optimal balanced matching (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 9953558).
- Li, Y. P., Propert, K. J., Rosenbaum P. R. (2001). Balanced risk set matching. *Journal of American Statistics Association, 96, 870–882.*
- Li, F., Zaslavsky, A. M., & Landrum, M. B. (2013). Propensity score weighting with multilevel data. *Journal of Statistics in Medicine, 32, 3373-3387.*
- Lichtenstein, G., Puma, J., Engelman, A., Miller, M. (2016). The Refugee Integration Survey Evaluation Project (RISE) Year Five: Final Report. Retrieved from: <https://sites.google.com/a/state.co.us/cdhs-refugee/refugees/about-refugees>
- Lopez-Cardozo, B., Talley, L., Burton, A. and Crawford, C. (2004). Karenni refugees living in Thai-Burmese border camps: Traumatic experiences, mental health outcomes, and social functioning. *Journal of Social Science and Medicine, 58* (12), 2637–2644.
- Lin, E. H., Carter, W. B., & Kleinman, A. M. (1985). An exploration of somatization among Asian refugees and immigrants in primary care. *American Journal of Public Health, 75*(9), 1080-1984.
- Lu, B. (2005). Propensity score matching with time-dependent covariates. *Journal of Biometrics 61, 121–728.*
- Lu, B., Greevy, R., Xu, X., Beck, C. (2011). Optimal nonbipartite matching and its statistical applications. *The American Statistician, 65*(1), 21-30.

- Maclean, S., Warr, D. and Pyett, P. (2009). Was it good for you too? Impediments to Conducting University-based Collaborative Research with Communities Experiencing Disadvantage. *Australian and New Zealand Journal of Public Health* 33(5), 407–412.
- Mackenzie, C., McDowell, C. and Pittaway, E. (2007). Beyond do no harm: The challenge of constructing ethical relationships in refugee research. *Journal of Refugee Studies* 20(2), 299–319.
- Mikesell, L., Bromley, E. & Khodyakoc, D. (2013). Ethical community-engaged research: A literature review. *American Journal of Public Health*, 103(12), 7-14.
- Miller, K. E. (2012). When you need to know quickly: the efficiency and versatility of focus groups for NGOs in conflict and post conflict settings, *Intervention* 10(2), 168 – 170.
- Miller, K. E., Fernando, G. A. & Berger, D. E. (2009). Daily Stressors in the lives of Sri Lankan Youth: A mixed methods approach to assessment in a context of war and natural disaster. *Intervention*, 7(3), 187-203.
- Miller, K.E. & Rasco, L.M. (2004). *The mental health of refugees: Ecological approaches to healing and adaptation*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Miller, K. E. & Rasmussen, A. (2010). War exposure, daily stressors, and mental health in conflict and post-conflict settings: Bridging the divide between trauma-focused and psychosocial frameworks. *Journal of Social Science and Medicine*, 70, 7-16.

- Miller, K. E., Weine, S. M., Ramic, A., Brkic, N., Bjedic, Z. D., Smajkic, A. (2002). The relative contribution of war experiences and exile-related stressors to levels of psychological distress among Bosnian refugees. *Journal of Traumatic Stress, 15*, 377–387.
- Mollica, R. F., Sarajlic, N., Chernoff, M., Lavelle, J., Vukovic, I. S., Massagli, M. (2001). Longitudinal study of psychiatric symptoms, disability, mortality, and emigration among Bosnian refugee. *Journal of the American Medical Association, 286*, 546–554.
- Murray, K. E., Davidson, G., & Schweitzer, R. (2010). Review of refugee mental health interventions following resettlement: Best practices and recommendations. *American Journal of Orthopsychiatry, 80*, 576–585.
- Neely-Barnes, S., Sanskas, S., Delavga, M. E. & Evans, T. K. (2014). Parenting with a disability and child mental health: A propensity score analysis. *Journal of Social Work and Disability Rehabilitation, 13*(3), 226-46, 226-246.
- Nichter, M. (1981). Idioms of distress: alternatives in the expression of psychosocial distress: A case study from South India. *Journal of Culture, Medicine & Psychiatry, 5*(4), 379–408.
- Nichter, M. (2010). Idioms of distress revisited. *Journal of Cultural, Medicine, and Psychiatry, 34*, 401-416.

- Pathways to Wellness. (2011). Refugee Health Screener-15: Development and use of the RHS-15. Retrieved from <http://www.lcsnw.org/pathways/index.html>
- Patton, M. Q. (2014). *Qualitative research and evaluation methods* (4th ed.). Sage: Thousand Oaks, CA.
- Pittaway, E., Bartolomei, L. and Hugman, R. (2010) Stop stealing our stories: The ethics of research with vulnerable groups. *Journal of Human Rights Practice* 2(2): 229–251.
- Porter, M., & Haslam, N. (2005). Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: A meta-analysis. *Journal of the American Medical Association*, 294, 602–609.
- Power, D. V. & Pratt, R. J. (2012). Karen refugees from Burma: Focus group analysis. *International Journal of Migration, Health, and Social Care*, 8(4), 156-166.
- Prentice, R. L. (1986). A case-cohort design for epidemiologic cohort studies and disease prevention trials. *Oxford Journal of Biometrika*, 73(1), 1-11.
- Ritchie J, Spencer L. (1994). *Qualitative data analysis for applied policy research*. In: Bryman A, Burgess G. eds. *Analysing qualitative data*. London: Routledge.
- Rosenbaum, P. R. (2010). *Design of observational studies*. Springer: New York: NY.
- Rosenbaum P, Rubin D. (1983). The central role of the propensity score in observational studies for causal effects. *Journal of the Royal Statistical Society*, 70(1), 41–55.
- Rohloff, H. G., Knipscheer, J. W., & Kleber, R. J. (2014). Somatization in refugees: A review. *Journal of Social Psychiatry and Epidemiology*, 49, 1793-1804.

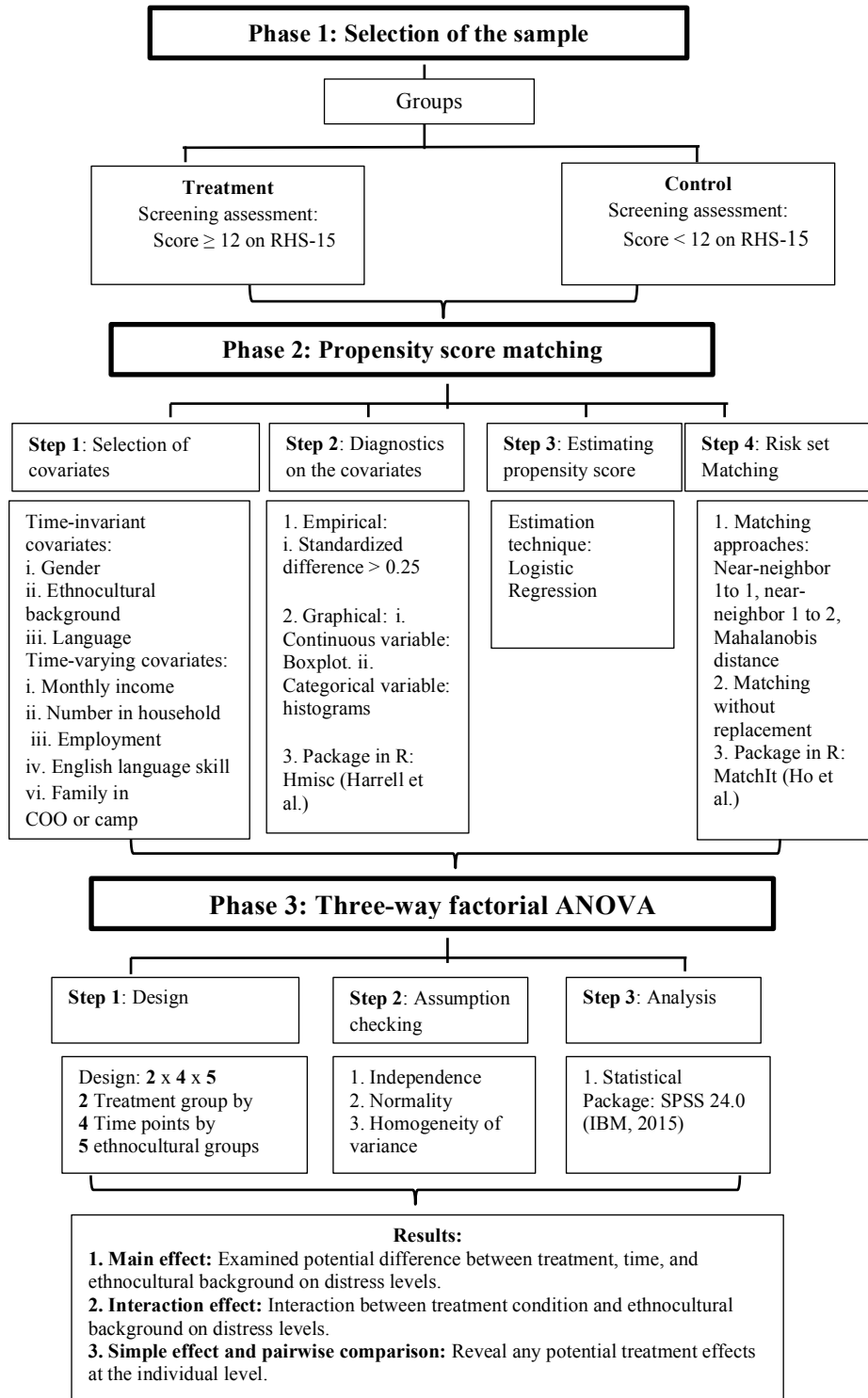
- Savin, D., Seymour, D. J., Nguyen-Littleford, L., Betteridge, J., & Giese, A. (2005). Findings from Mental Health Screening of Newly Arrived Refugees in Colorado. *Public Health Reports, 120*, 224-229.
- Schibel, Y., Fazel, M., Robb, R., Garner, P. (2002). Refugee integration: Can research synthesis inform policy? London, UK: Home Office Research Development and Statistics Directorate.
- Schweitzer, R. D., Brough, M., Vromans, L., & Asic-Kobe, M. (2011). Mental health of newly arrived Burmese refugees in Australia: Contributions of pre-migration and post-migration experience. *Australian and New Zealand Journal of Psychiatry, 45*(4), 299–307.
- Schweitzer, R. & Steel, Z. (2008). Researching refugees: Methodological and ethical considerations. *Social Indicators Research Series, 34*. 87-101.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Experimental and quasi-experimental designs for generalized causal inference. Houghton-Mifflin Publications: New York, New York.
- Shannon, P., Im, H., Becher, E., Simmelink, J., Wieling, L., & O’Fallon, A. (2012). Screening for war trauma, torture and mental health symptoms among newly arrived refugees: A national survey of state refugee health coordinators. *Journal of Immigrant and Refugee Studies, 10*(4), 380–394.
- Shannon, P. J., Vinson, G. A., Cook, T. L., & Lennon, E. (2015). Characteristics of successful and unsuccessful mental health referrals of refugees. *Administration*

- and Policy in Mental Health and Mental Health Services Research*, 639-653.
- Shannon, P. J., Wieling, E., Simmelink-McCleary, J., & Becher, E. (2014). Beyond stigma: Barriers to discussing mental health in refugee populations. *Journal of Loss and Trauma*, 20(3), 281-296.
- Silove, D., Sinnerbrink, I., Field, A., Manicavasagar, V., & Steel, Z. (1997). Anxiety, depression and PTSD in asylum-seekers: Associations with pre-migration trauma and post-migration stressors. *The British Journal of Psychiatry*, 170(4), 351–357.
- Simmelink, J. A., & Shannon, P. (2012). Evaluating the mental health training needs of community-based organizations serving refugees. *Advances in Social Work*, 13(2), 325-339.
- Slobodin, O., & de Jong, J. (2015). Mental health interventions for traumatized asylum seekers and refugees: What do we know about their efficacy? *International Journal of Social Psychiatry*, 61(1), 17-26.
- Steel, Z., Chey, T., Silove, D., Marnane, C., Bryant, R. A., & Van Ommeren, M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement. *Journal of the American Medical Association*, 302(5), 537–549.
- Suarez-Balcazar, Y., Taylor, R., Davis, M., editors. (2004). Participatory community research: Theories and methods in action. American Psychological Association; Washington, D.C.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th ed.), Pearson: Boston, MA.

- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- Taylor, E. M., Yanni, E. A., Pezzi, C., Guterbock, M., Rothney, E., Horton, E., Montour, J., Elias, C., & Burke, H. (2014). Physical and mental health status of Iraqi refugees in the United States. *Journal of Immigrant Minority Health, 16*, 1130-1137.
- Tervalon, M., & Murray-Garcia, J. (1998). Cultural humility versus cultural competence: A critical distinction in defining physician training outcomes in multicultural education. *Journal of Health Care for the Poor and Underserved, 9*(2), 117-125.
- Tol, W. A., Komproe, I. H., Jordans, M., Gross, A., Susanty, D., Macy, R., de Jong, J. T. (2010). Mediators and moderators of a psychosocial intervention for children affected by political violence. *Journal of Consulting and Clinical Psychology, 78*, 818-828.
- United Nations High Commissioner for Refugees. (2011a). Global trends. Retrieved from <http://www.unhcr.org/statistics>
- United Nations High Commissioner for Refugees. (2011b). UNHCR resettlement handbook. Retrieved from <http://www.unhcr.org/4a2ccf4c6.html>
- United Nations High Commissioner for Refugees. (2008). 2007 Global trends: Refugees, asylum-seekers, returnees, internally displaced and stateless persons. Geneva: UNHCR.

- Van Loon, A., Van Schaik, D., Dekker, J. & Beekman, A., (2011). Effectiveness of an intercultural module added to the treatment guidelines for Moroccan and Turkish patients with depressive and anxiety disorders. *BMC Psychiatry*, 11(13), 1-12.
- Van Ommeren, M., Sharma, B., Sharma, G. K., Komproe, I., Cardena, E., de Jong J. T. (2002). The relationship between somatic and PTSD symptoms among Bhutanese refugee torture survivors: Examination of comorbidity with anxiety and depression. *Journal of Traumatic Stress*, 15, 415–421.
- Voutira, E. & Doná, G. (2007). Refugee research methodologies: Consolidation and transformation of a field. *Journal of Refugee Studies*, 20(2), 163-171.
- Walsh, F. (2007). Traumatic Loss and Major Disasters: Strengthening Family and Community Resilience. *Journal of Family Process*, 46(2), 207-227.
- Wilkinson, S. (1998). Focus groups in health research: Exploring the meaning of health and illness. *Journal of the Health Psychology*, 3, 329-348.
- Yoon, J. & Bernell, S. L. (2013). The Role of Adverse Physical Health Events on the Utilization of Mental Health Services. *Health Services Research*, 48(1), 175-194.

Appendix A



Appendix B

REFUGEE HEALTH SCREENER (RHS-15)

Instructions: Using the scale beside each symptom, please indicate the degree to which the symptom has been bothersome to you over the past month. Place a mark in the appropriate column. If the symptom has not been bothersome to you during the past month, circle "NOT AT ALL."



SYMPTOMS	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
1. Muscle, bone, joint pains	0	1	2	3	4
2. Feeling down, sad, or blue most of the time	0	1	2	3	4
3. Too much thinking or too many thoughts	0	1	2	3	4
4. Feeling helpless	0	1	2	3	4
5. Suddenly scared for no reason	0	1	2	3	4
6. Faintness, dizziness, or weakness	0	1	2	3	4
7. Nervousness or shakiness inside	0	1	2	3	4
8. Feeling restless, can't sit still	0	1	2	3	4
9. Crying easily	0	1	2	3	4

The following symptoms may be related to traumatic experiences during war and migration. How much in the past month have you:

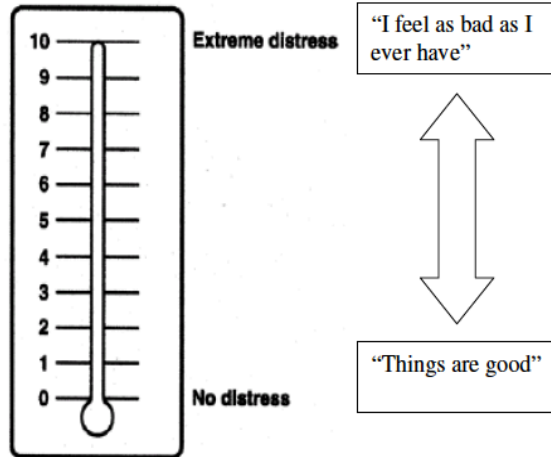
10. Had the experience of reliving the trauma; acting or feeling as if it were happening again?	0	1	2	3	4
11. Been having PHYSICAL reactions (for example, break out in a sweat, heart beats fast) when reminded of the trauma?	0	1	2	3	4
12. Felt emotionally numb (for example, feel sad but can't cry, unable to have loving feelings)?	0	1	2	3	4
13. Been jumpier, more easily startled (for example, when someone walks up behind you)?	0	1	2	3	4

REFUGEE HEALTH SCREENER (RHS-15)

14. Generally over your life, do you feel that you are:
- Able to handle (cope with) anything that comes your way0
 - Able to handle (cope with) most things that come your way1
 - Able to handle (cope with) some things, but not able to cope with other things.....2
 - Unable to cope with most things.....3
 - Unable to cope with anything4
- 15.

Distress Thermometer

FIRST: Please circle the number (0-10) that best describes how much distress you have been experiencing in the past week including today.

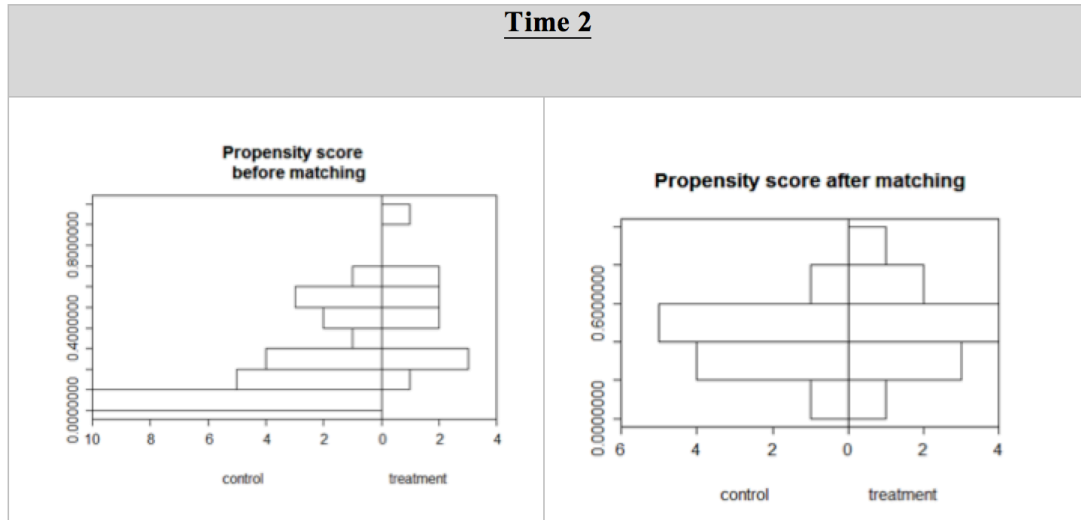


ADD TOTAL SCORE OF ITEMS 1-14: ____

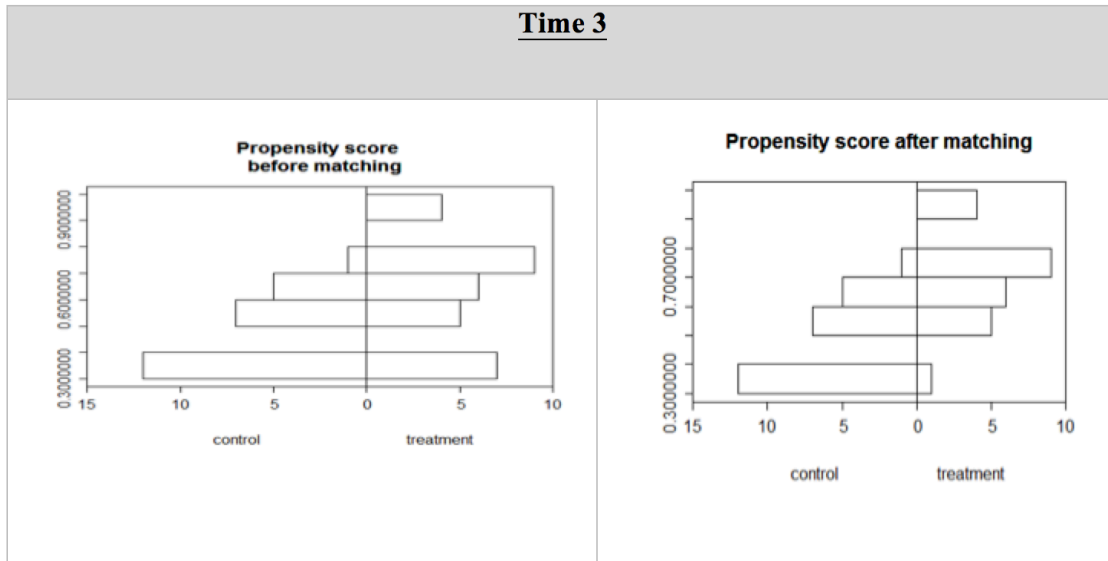
SCORING		
Screening is POSITIVE		
1. If Items 1-14 is ≥ 12 OR	Self administered: ____	
2. Distress Thermometer is ≥ 5	Not self administered: ____	
CIRCLE ONE:	SCREEN NEGATIVE	SCREEN POSITIVE
		REFER FOR SERVICES

Appendix C

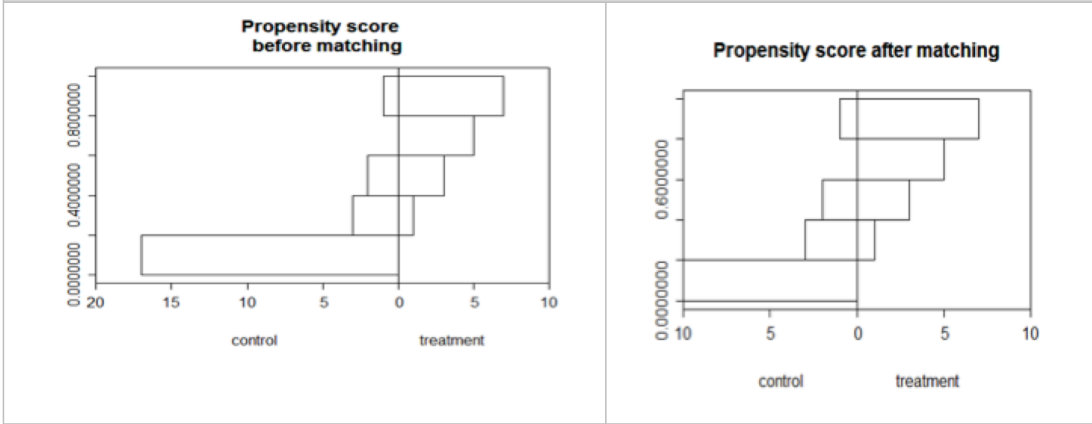
Time 2



Time 3



Time 4



Time 5

