An Exploratory Study of the Relationship between Attention-Deficit Hyperactivity Disorder and Youth Homelessness

By

Blake Harding

A thesis submitted in partial fulfillment of the

requirements for the degree of

Bachelor in Arts

in the Subjects of Neuroscience, Public Health and Human Development

in the

Undergraduate Division

of the

University of California, Berkeley

Thesis Advisors:

Professor Rakesh Bhandari, Chair
Professor Stephen P. Hinshaw
Professor Jennifer Arter

Summer 2014

Acknowledgements

A huge amount of gratitude goes to my primary thesis advisor Professor Rakeesh Bhandari for his incredible wisdom, insight and encouragement and for his humble dedication to working with me on this thesis. I want to thank my program mentor Professor Peter Sahlins for his invaluable guidance and for supporting me in "doing my own thing" while at Berkeley. An incredible amount of appreciation goes to the invaluable Berkeley-Sage Mentoring Program for providing many early experiential field research opportunities, for pushing me outside my comfort zone and towards the interdisciplinary study of neuroscience, public health and human development with a particular focus on attention, plasticity and learning processes. Special thanks to the faculty and after school programs at Berkeley Arts Magnet Elementary (BAM) and Manzanita-SEED Elementary schools for being so kind and welcoming.

Shout out to my 5th grade mentee Miguel for inspiring me to further investigate adolescent neurodevelopmental conditions such as Attention-Deficit Hyperactivity Disorder (ADHD). An incredibly heart warming thank you to Professor Sephen Hinshaw for providing invaluable feedback and going the extra mile to assist on this thesis despite his extremely demanding schedule. I appreciate the kindness and generosity extended to me by Professor Jennifer Arter in serving as a reader/reviewer. While they did not provide any direct assistance on this thesis, I want to thank Professor Georgina Kleege and Professor Mary Kelsey for being excellent leaders, innovative educators and inspiring individuals. I want to thank my dear friends for being so supportive and encouraging during the many long summer nights I spent holed up writing, analyzing studies and doing field research for this thesis. A final note and nod goes out to the

Berkeley D-Lab for serving as an incredible resource in guiding my data collection, statistical analyses and tackling the R/R-Studio statistical package.

Table of Contents

Dedication

This thesis is dedicated to my father, Edward Forrest Dutcher. He was murdered on October 31, 2010 on the streets of Austin, Texas. He spent the majority of his life as a homeless transient and multi-comorbid addict in Austin. While I did not get to know him well, he will forever permeate in my life as an influential figure driving me to find solutions to alleviate unnecessary suffering and to embody a deeply humble spirit in every pursuit. I also want to dedicate this thesis to my grandparents for their lifelong support and encouragement in my pursuits. I'm forever grateful for their mensch, kindness and humanity.

Abstract

An Exploratory Study of the Relationship between Attention-Deficit Hyperactivity Disorder and Youth Homelessness

By

Blake Harding

Bachelor of Arts in Neuroscience, Public Health and Human Development

University of California, Berkeley

Professor Rakesh Bhandari, Chair

A 1997 study by Lomas and Garside suggests a 62% prevalence rate of ADHD amongst homeless, which prompts a need for elucidation of this relationship. This thesis study sought to examine the relationship between Attention-Deficit Hyperactivity Disorder and the homeless youth population aged 18-24. The overall focus was to investigate the prevalence rate of ADHD in homeless youth 18-24 and to examine the relationship between ADHD diagnosis (utilizing WURS and ASRSv1.1) and relational variables. A structured survey instrument was developed to collect interview data on demographics, employment status, substance abuse and housing instability variables. Twenty-four homeless youths (n=24, 20 males, 4 females; age range, 18-24, mean age=21.71 years) were randomly approached (n=85 approached) and verbally screened for study inclusion based upon reported age between 18 to 24 years. Participants were administered the ASRS-v1.1 and WURS dichotomous response structured survey instruments to determine ADHD diagnosis. Study data suggests a higher prevalence of

ADHD in ages 18-21 (WURS 75%; ASRS-v1.1 88%) than ages 22-24 (WURS 56%; ASRS-v1.1 88%). Data suggests a marginally higher rate of ADHD diagnosis in males (ASRS-v1.1 95%; WURS 75%) than females (ASRS-v1.1 75%; WURS 75%). Participants in the 18-21-age cohort experienced an average of 68 days of housing instability while participants in the 22-24-age cohort experienced a proportionally higher average of 278 days of housing instability. Both age cohorts (18-21 and 22-24) suggested a 100% rate of unemployment and substance abuse. The majority of participants were Caucasian (18-24 88%; 22-24 94%; sample mean, 89%) with marginal African-Americans (18-21 13%; 22-24 6%; same mean, 5%) and other identified ethnicities (6%; age cohort 22-24). Data suggests a higher prevalence of ADHD in homeless youth aged 18-21 (WURS 75%; ASRS-v1.1 88%) that were newly homeless (avg. days experienced housing instability, 68), which may suggest that ADHD symptomatology could be a vulnerability factor influencing youth homelessness.

Introduction

Research Questions

This focus of this thesis study is to examine three research questions: 1) Does there exist a high prevalence of Attention-Deficit Hyperactivity Disorder (ADHD) in the San Francisco Bay Area's homeless youth population aged 18-24 as measured by the Wender Utah Rating Scale (WURS) and Adult ADHD Self-Report Scale (ASRS-v1.1)?, 2) Are there correlates between the dependent variable of ADHD diagnosis and independent variables of collected demographics, employment status, substance abuse and housing instability? and 3) Is ADHD a vulnerability risk factor for youth homelessness?

A Consideration of The Research Questions

The working hypotheses of this study is two fold: a) Homeless youth in the San Francisco Bay Area aged 18-24 have a persistently high prevalence of Attention-Deficit Hyperactivity Disorder (ADHD) and b) This extraordinarily high prevalence of ADHD in homeless youth can be theorized as a vulnerability risk factor for youth homelessness. This vulnerability risk factor can be conceptualized as an influential or impressionable force driving and/or fostering developmental ineffectiveness or frustration in the individual. The focus of this study is to explore this possible high rate of ADHD prevalence in youth population aged 18-24 and to examine the overall relationship between ADHD and homelessness. In this examination of ADHD prevalence and related vulnerability risk factors, data from a structured survey instrument will be examined in relation to ADHD diagnosis to determine any possible relationships. This possible insight

may provide a substantive basis for ascertaining and theorizing both the purportedly high prevalence of ADHD in homeless youth and further the explication of ADHD as a vulnerability factor in this population.

The Issue of ADHD in Homeless Youths

A 1997 Veterans Administrations convenience sample study reported Attention-Deficit Hyperactivity Disorder incidence as 62% amongst homeless populations (Lomas & Gartside, 1997). ADHD exists as the most prevalent childhood and adolescent behavioral health problem affecting one in nine children and adolescents and one in six boys (Hinshaw & Scheffler, 2014). Yet ironically despite this appreciably high ADHD prevalence, research on ADHD in homeless youths remains scarce. In essence, the relationship between ADHD and youth homelessness exists as a marginalized aperture in scholarship. While ADHD prevalence rates are suggested as pervasive in the youth homeless population, homelessness in its own right remains a longstanding and serious issue with about 2.8 million youth runaways per year. Surprisingly, this 2.8 million figure does not include the approximately 1.6 million chronically and persistently homeless youths. Incredibly, more recent studies have shown the incidence of persistently homeless youth to be as high as 3 million, which suggests a nearly double in the amount of chronically homeless youth in the last decades (Moore, 2005).

Despite research suggesting this nearly doubling of chronically homeless youth over the last decades, relatively little viable research is available on this population as a whole. In fact the generality of homeless populations remains chronically understudied with homeless youths being the least studied subpopulation (Cauce, et al., 2000; Moore,

2005). Thus, such a marginalized, underserved and vulnerable population demands the attention of researchers, policy makers and clinicians. A sustained, substantive, and rigorous inquiry examining the prevalence rate of ADHD in the homeless youth population is profoundly indicated. There exists an urgent need to catalyze increased awareness and generate additional empirical data to facilitate the development of possible pragmatic solutions to alleviate unnecessary suffering, reduce socioeconomic strain and put to productive use a vastly untapped, resilient and creative subpopulation (Moore, 2005).

An Urgent Need: An Elucidation of ADHD in Homeless Youths

This cross-sectional study has focused on recruiting youth participants aged 18-24 from the San Francisco Bay Area's "hang out" areas. These "hang out" areas include the Haight-Ashbury district in San Francisco, The Larkin Street Youth Services shelter in San Francisco and the areas surrounding UC Berkeley, Telegraph Avenue and People's Park in Berkeley, CA. These locations have been selected in order to obtain a regionally representative sample of both sheltered and non-sheltered youth populations. A structured qualitative interview instrument has been developed to capture relevant demographics (age, sex, ethnicity, et cetera) and variables like housing instability in the last 12 months. However, the identity of recruited study participants will remain anonymous and codified by number (1, 2, 3, et cetera) in order to protect the inherent sensitive of this vulnerable population and to comply with intuitional human subject protocols.

The study participants will be asked questions like "Have you used a substance with in the last 12 months?" and "Are you employed, unemployed or disabled?" The structured Adult Attention Deficit Symptom Checklist (ASRS-v1.1) is used as a

screening instrument and to determine the severity of symptoms. The Wender Utah Scale (WURS) is utilized to determine ADHD diagnosis in those study participants who respond in the affirmative to one or more of the six (6) screening questions on the ASRS v1.1 instrument. The chief pursuit of this thesis is to explore the research questions set forth in relation to the examination of the relational connections between ADHD and youth homelessness. The research data captured for analysis in this study could be utilized to provide further insight into the incidence and relationships of ADHD in the homeless youth population. This further insight into the relationships between ADHD and homeless youths could aid in determining the plausibility of utilizing ADHD as an associated vulnerability factor demystifying the existence of possible connections. These associated factors would be theorized and conceptualized utilizing analytical comparison of affirmative/negative diagnoses of ADHD and dependent variables.

The awareness of ADHD prevalence and possible associated relationships of this variable in regard to the homeless youth population could promote further understanding, dialogue and spark more exhaustive cross-section and longitudinal studies with larger sample sizes. This thesis and more comprehensive rigorous research studies centered with studying ADHD in the homeless youth populations could be utilized to influence policy direction and the development of homeless and/or runaway predictive analytical models tailored to the sentiments and specificities of the youth homeless population. These tailored predictive analytical models could provide empirical scaffolding to spark empirical early stage intervention strategies in social welfare programs, improved educational curriculum and increase continuity of biomedical services delivery.

Studying the prevalence, presentations and relationships of ADHD in the homeless youth population is critically necessary. This incredibly vulnerable population wholeheartedly demands research attention. Aside from this further empirical research providing possible early stage interventions strategies, such research could serve as a catalyst for efficient and pragmatic solutions in wider public policy. This research might broadly inform legislative and public policy that could provide targeted and effectual utilization of private and public funding sources directed towards more reliable early intervention protocols and strategies.

These early intervention efforts could potentially lead to measurable decreases in youth homelessness and encourage numerous value added socioeconomic and societal benefits. Since the youth homeless population is composed of diverse lifespan development statuses, such homeless youth research also has relevance, applicability and implications for other interrelated homeless and non-homeless populations. To be sure, homeless youths do not deserve the level of incredible neglect and structural violence encountered on the streets and elsewhere. If there is a means to curb or eliminate the deplorable and often ignored plights and pathologies of homeless youth through empirical research, then such research is critically necessary for improving homeless youth welfare, contributing to the socioeconomic success of society and most convincingly as a moralistic imperative.

Literature Review

Introduction

The pursuit of this literature review is to: 1) provide a rigorous review of the conflicting conceptualizations of Attention-Deficit Hyperactivity Disorder (ADHD), 2) provide scaffolding in which to explore the diverse homeless youth and runaway population in this study and 3) elucidate the relationship between ADHD and youth homelessness.

Etiology of a Brain-based Neurodevelopmental Disorder

The first description of what appears to be Attention-Deficit Hyperactivity Disorder (ADHD) is described by Scottish Physician Sir Alexander Crichton in 1798 in a three book publication titled "An inquiry into the nature and origin of mental derangement: comprehending a concise system of the physiology and pathology of the human mind and a history of the passions and their effects." Notably this is one of the first publications "written fully on the subject of Mental Diseases." The second chapter of the second book titled "On Attention and its Diseases" by Crichton is of particular importance in exploring the early etiology of ADHD. The issue of human attention is described as varying in the individual, context and time and does not innately require pathological understanding. However, when the pathology of attention gyrates from two oppositional extreme poles and "constancy to any one object of education," then a condition of the "sensibility of nerves" is indicated (Crichton 1798; Lange, Reichi, Lange, Tucha, & Tucha, 2010)

George Still sets forth another complimentary and more clinically substantive description of Attention-Deficit Hyperactivity Disorder (ADHD) as a set of

neurodevelopmental symptoms in the 1902 Goulstonian Lectures on “Some Abnormal Psychic Conditions in Children.” In these lectures, Still describes the condition of ADHD as a non-normalized “moralistic” physical motor control defect in children driven by an environmental cognitive deficit. In this early conceptualization of ADHD, Still hypothesized that moral consciousness was required in order to maintain motor control connection with the environment and perpetuate normative ideals of behavior conformity “for the good of all.” The condition was first described as an impairment of intellect with out physical disorder in which arrested development occurred, but symptoms were often not realized under children were several years beyond infancy (Still, 1902).

While Still first identified this “impairment of intellect with out physical disorder” as having early organic neurobiological etiology, this clinical inference was largely ignored in the construction of the American Psychiatric Association's *Diagnostic Statistical Manual-II* (APA DSM-II) release in 1968 when the disorder is first labeled as “Hyperkinetic reaction of childhood or adolescence.” The Hyperkinetic terminology is extrapolated from the German physicians Franz Kramer and Hans Pallnow who first wrote of adolescents presenting with restless motor drive, rhythmic purposelessness, fidgeting and quick attention shift in “On a hyperkinetic disease of infancy” (“Über eine hyperkinetische Erkrankung im Kindesalter”) (Lange, Reichi, Lange, Tucha, & Tucha, 2010).

The 1968 DSM-II symptomatic approach to ADHD ignored the suspected neurodevelopmental etiology first clinically hypothesized by George Still (1902). Rather the DSM-II ADHD conceptualization focuses on the symptomatic based presentations of ADHD. Prior to this symptomatic focus, ADHD has occupied a series of different

codifications with descriptive symptoms akin to a head injury, influenza and other nonspecific neurological brain damage causing encephalitis, emphasizing the perceptual motor and subtle neurological signs not included in the 1968 DSM-II. It was not until 22 years later that the condition was relabeled in the 1980 *Diagnostic Statistical Manual-III* (DSM-III) as "ADD (Attention-Deficit Disorder) with or without hyperactivity." The label "ADD" was further revised in the 1987 *Diagnostic Statistical Manual-III*-R (DSM-III-R) to "Attention-Deficit Hyperactivity Disorder (ADHD)," which is the present diagnostic and colloquial label noted in the current 2013 *Diagnostic Statistical Manual-5 (*DSM-5) (Lange, Reichi, Lange, Tucha, & Tucha, 2010).

This symptomatic approach conceptualizations of ADHD seen in the 1968 DSM-II, 1980 DSM-III, 1987 DSM-III-R, 1994 DSM-IV and 2000 DSM-IV-TR has remained largely in the forefront until the recent 2013 release of the DSM-5 begin to conceptualize ADHD in line with the state of morphing scholarship. ADHD is presently defined in the DSM-5 as a highly comorbid neurobiological development disorder with a 5% occurrence across cultures and a 2.5% adulthood persistence rate. The present DSM-5 defines ADHD as belonging to either the "Inattention" or "Hyperactivity and Impulsivity" groups in which diagnoses can be made as combined, primarily inattentive or hyperactive/impulsive and of varying degrees of severity including mild, moderate and severe. The diagnosis can further be codified as in partial remission if diagnostic criteria has been met for the previous six (6) months and "symptoms results in no more than minor impairments in social or occupational functioning" (DSM-5) (American Psychiatric Association, 2013).

Validity of the ADHD Diagnosis

There are a myriad of diagnostic techniques that can be employed in ADHD diagnosis including structured/semi-structured clinical interview, survey instruments, response to pharmacology and anecdotal reports from family and others. However, inherent in these diagnostic techniques is a wide variability in the diagnostic methods employed amongst clinicians and inherent subjectivity in the present conceptualization of ADHD as noted in the 2013 DSM-5. The DSM-5 diagnostic criterion is anecdotally garnered from researchers, diagnosticians and clinicians primarily from Western culture (American Psychiatric Publishing, 2013; Nigg, 2012). In consideration of new neurobiological directions in ADHD research, a push towards more empirical means of diagnosis and treatment is merited considering the present widely subjective state of the ADHD DSM-5 diagnostic criteria. As significant neuroscience evidence builds, the possibility strengthens that an efficient and effective neurobiological-rooted empirical diagnostic protocol will be developed (Hinshaw & Scheffler, 2014; Farone, Sergeant, Gillberg, & Biederman, 2003).

Homeless Youths in the United States

Youth homelessness has existed throughout American history as a pervasive and endearing social issue. The settlement of the colonies and subsequent westward expansion drove many youths to leave home for adventure and economic opportunity, while another other youths fled or were abandoned as a result of unstable family circumstances. In early America during the 17th and 18th centuries, running away was romanticized due to youthful hopes of finding a better life away from family home and life shortcomings. There is wide belief that youths begin running away or becoming

homeless as a result of the counterculture movement of the 1960's, but as noted above this is simply not true. The beginning of the 1960's however saw an increased interest into runaway and homeless youths behaviors. Despite this increased interest into analyzing, researching and attempting to further understand the youth runaway and homeless population phenomena, there still exists an inclination to dismiss runaway and homeless behavior as delinquent activity or as a psychiatric disorder despite little consensus on the etiologies and pathologies of these behaviors (Libertoff, 1980; Smollar, 1990).

Estimates

While the precise number of homeless living on the streets, in shelters and other transient forms of accommodation is not known, research suggests 100,000-500,000 to 1-2 million experience homeless on US streets every night according to predictions from 1980-1990's research (Libertoff, 1980; Smollar, 1990). More recent scholarship suggests the likelihood of an increase in homelessness with the lower limit figure reaching 1.6 million and the upper limit still suggested as 2 million (Cauce, et al., 2000). The prevalence of homelessness is difficult to determine due to a myriad of factors including the inherent transient nature of the population and variability in the definitions of homelessness utilized in research (Moore, 2005).

Definitions

There exists a wide variability in the definitions of homeless adults and adolescents in research studies due to the inherent transient nature of these populations.

However, for the purposes of this study, the US Federal Government definition of homelessness is utilized. This definition of homeless includes "anyone who lacks a fixed, regular, and adequate nighttime residence; and whose primary nighttime residence is a supervised shelter designed to provide temporary living accommodation, including emergency shelters, transitional housing, or a place not designed for regular nighttime human habitation (e.g., such as under a bridge or in a car)."

The U.S. Department of Urban Housing (HUD) and the McKinney-Vento Homelessness Assistance Act provide two major legal definitions of homeless youths. HUD defines homeless youths as "unaccompanied youth who have not had a lease or ownership interest in a housing unit in at least 91 days, have had three or more moves in the past 90 days, and who are likely to continue to be unstably housed." While the McKinney-Vento Act defines homeless defines youths as "individuals who lack a fixed, regular, and adequate nighttime residence," which includes a variety of housing contexts including parking lots, hospitals, train stations, cars, camping grounds or lack of access to "alternative adequate accommodations." The Act also provides a provision for migratory children who are homeless as defined by lack of access to "alternative adequate accommodations."

HUD defines "youth" as 25 years of age or younger and "children" as under 18 years of age. The McKinney-Vento Act broadly defines children and youth as 21 and under. The Runaway and Homeless Youth Act classify the "youth age" as not more than 21 years of age. However, the MV Act suggests studies in populations no less than 13 years of age, but no more than 26, implying that a broader definition of the "youth" is warranted. The prime allocation of funds under the act however is to individuals under 18

years of age. A number of governmental and nonprofit youth services agencies focus on the transitional youth age range of 18-24, but in some cases offer services to individuals aged 25 (and in rare cases age 26) in accordance with HUD definitions (HUD Exchange, 2014; Larkin Street Youth Services, 2014; All Youth Services, 2014; U.S. Department of Health and Human Services, 2008).

ADHD and its Relationship with Homeless Youths

At present there are a limited number of studies examining the prevalence rate of ADHD in transitional homelessness young adult, adolescent and youth populations aged 17-26. The limited studies presently available consistently report high prevalence rates of ADHD in homeless youth aged 17-26 (Lomas & Gartside, 1997; Wormer, 2003; Natasha Slesnick, 2005; Moore, 2005; Cauce, et al., 2000; Unger, Kipke, Simon, Montgomery, & Johnson, 1997; Rosler, et al., 2004). But relevant, rigorous and comprehensive research remains elusive in the investigative relationships between ADHD and homeless youth. One study in 1997 by Lomas & Gartside focused on the adult homeless population among a convenience sample of a Veterans Administrations (VA) outpatient psychiatric clinic concludes a 62% prevalence rate for ADHD with a reported mean age of 42.5 years. The mean age for those screening negative for ADHD was 40.4 years of age. In this study only the mean age is reported for study participants and since this a population study of military veterans, it may be unlikely the study sample contains youths aged 18-24.

A 1999 paper by Stanford, Sandrock, Helvie, Royal-Stanford, & McLaughin published at the A.P.H.A Conference in Chicago reports that in a sample size of 51

homeless individuals, 42% qualified for diagnosis of ADHD, confirming the high rate of ADHD diagnosis of Lomas, et al. The National Health Care for the Homeless Council (2002) suggests a high incidence of ADHD in homeless children of families. Stanford, et al. and the National Health Care for the Homeless Council have suggested that ADHD is the result and not the cause of youth homelessness. This suggested causation behind ADHD stands as an intriguing suggestion, but not a conclusion currently supported by empirical data. Another study published in 2004 by Rosler, et al. focused on investigating ADHD in a German youth male prison population aged 17-22 +/-. This study reports an ADHD prevalence of 45% utilizing the utilizing DSM-IV criteria in a youth prison population in comparison to a 1.9% prevalence in the healthy control group. Another study examined ADHD prevalence in a sampling of transitional adolescent's and youths aged 13-21. This study shows a 32% rate of diagnosis among youths aged 13-21 (Cauce, et al., 2000).

A dissertation study examining ADHD in adult homeless male populations was published in 2004 by Kocsis and is titled "Attention Deficit Hyperactivity Disorder and Homelessness: Is there a connection?" This dissertation study cites the 1997 Lomas, et al. study as the sole available scholarship investigating ADHD in homeless populations at the time of publishing, however this does not appear to be the case as demonstrated by 1999 Stanford, et al study. This dissertation study focused exclusively on the male homeless subpopulation and includes a small sample of 4 subjects (3.7%) aged 18-29 with the majority of subjects 40-49 years of age (45.8%). This study reports a 50% prevalence rate of ADHD-Inattentive symptoms and supports earlier research suggesting an approximately 1 in 2 prevalence rate of ADHD in the homeless youth populations

(Moore, 2005). Due to the small study sample of 4 subjects aged 18-29, the data is likely skewed, but remains anecdotally relevant to this literature review.

A number of complimentary studies anecdotally and secondarily examine ADHD incidence in the homeless youth population aged 18-24. One such study by Unger, Kipke, Simon, Montgomery, & Johnson was published in 1997, the same year as Lomas, et al. 1997 and assessed the presence of ADHD utilizing a 4-item scale contained with in *Adolescent Diagnostic Interview*. An affirmative response to any one of the 4 questions indicates a high probability of diagnosis according to correspondence with Ken Winter's, the author of the *Adolescence Diagnosis Interview* instrument. This study found a 22.1% ADHD incidence among youths aged 12-18 and 17.8% incidence among youths aged 19-24.

In consideration of the minimalist 4-question survey instrument, the incidence rate of ADHD reported in this study may be incomplete, but still remains relevant considering the small amount of research available on the homeless youth population. Another study performed in 2003 by Wormer investigated homeless youth aged 14-21 seeking social welfare assistance and made a "key finding" of a high mention of ADHD in the course of study sampling. The study reports a 9.3% mention rate of ADHD on a form line item inquiring about self-reported diagnosis in a sample size of 129. The study authors note that 9.3% ADHD incidence rate could be underreported and not representative of the population sampled.

Methodology

Participants

Twenty-four homeless youths (n=24, 20 males, 4 females; age range, 18-24, mean age=21.71 years) were randomly approached (n=85 approached) and verbally screened for study inclusion based on reported age between 18 to 24 years.

Sampling Design and Participant Recruitment

Data reported has been acquired from a cross-sectional study of homeless youth from "hang out" areas in the San Francisco Bay Area. Participants were determined to be eligible for study inclusion if determined to be 18-24 years of age and at risk of homelessness. Youths were considered at an imminent risk of homelessness if they had experienced housing instability in the last 12 months. The question of housing instability in the last 12 months was chosen since research has shown that youths homeless for one year or longer fully integrate into homeless culture (Moore, 2005). Participants were considered to have experienced housing instability if they did not have access to stable, regular and secured housing and/or a normalized space regularly used for sleeping. Such unstable sleeping locations may include a park, street, abandoned building, shelter, car, hotel/motel, couch surfing, prison or hospital. It was determined that youth should be randomly sampled from various "hang out" areas in the San Francisco Bay Area as well as those presently living in youth shelters in order to obtain a representative sample.

Written informed consent was provided, explained to the youths in detail and obtained prior to proceeding to data collection. Monetary compensation ($10/per

participant) was provided to youths who voluntarily chose to participate in the study. Due to the inherent sensitivity and vulnerability, youths were advised of prophylactic referral services and provided assistance in accessing these services if necessary. In the course of the study, no youths requested referral to further supportive services or withdrew from the study retroactively. There were seven (n=7) youths were excluded because they declined to participate in the study primarily due to time constraints and/or possible mistrust of those affiliated with research, social services or government entities. None of the youths reported as being under the age of 18 years of age. While it is not possible to determine precise age due to the transient nature of the subject, every effort was made to exclude youths under 18 from the study due to inability to obtain informed consent.

Measures

Participants were first administered a structured response survey instrument to determine if the participant qualified for inclusion in the study based on reported age between 18 and 24. Participants were asked questions like, “Have you experienced housing instability in the last 12 months?” with a possible answer range between 1-365. The participants selected one of the provided responses that best fit their subjective reports. Participant responses were then recorded on the structured survey form for further analysis. Study participants were then administered the ASRS-v1.1 ADHD six-question dichotomous response screening instrument and the WURS ADHD dichotomous response sixty-one-question diagnostic survey instrument.

The ASRS-v1.1includes questions like “How often do you have trouble wrapping up the final details of a project once the challenging parts have been done?” This question

and the reaming six others are designed to illicit responses to determine if any ADHD symptomology exists. The ASRS-v1.1 six (6) question-screening instrument has a sensitivity of 68.7% and classification accuracy of 97.9% (Kessler, et al., 2005). Participants with one or more affirmative responses to the six (6) screening instrument were evaluated further for ADHD utilizing the remaining twelve (12) questions of the ASRS-v1.1 instruments eighteen (18) questions.

After administration of the ASRS-v1.1 survey, the WURS instrument was administered utilizing the surveys sixty-one (61) question with twenty-five (25) questions with specific validity in relation to ADHD assessment and diagnosis. The remaining thirty-six (36) WURS questions are indicative of differential psychopathology, which was not assessed in this thesis study. The ASRS-v1.1 was utilized to measure qualitatively the relative level of ADHD symptom severity in proceeding with further analysis of participants ADHD symptomology, while the WURS instrument served as a baseline comparative diagnostic assessment protocol.

Variables

Sex (M/F), age (18-24), ethnicity (White, African-American, Asian, Latino, Native American, Pacific Islander), employment status (unemployed, employed, disabled) duration of housing instability (1-12 ≥ months), substance use in last 12 months (Yes/No) and diagnosis of ADHD as determined by administration of ASRS-v1.1 and WURS structured survey instruments.

Results and Discussion

This focus of this thesis study is to examine three research questions: 1) Does there exist a high prevalence of Attention-Deficit Hyperactivity Disorder (ADHD) in the San Francisco Bay Area's homeless youth population aged 18-24 as measured by the Wender Utah Rating Scale (WURS) and Adult ADHD Self-Report Scale (ASRS-v1.1)?, 2) Are there correlates between the dependent variable of ADHD diagnosis and independent variables of collected demographics, employment status, substance abuse and housing instability? and 3) Is ADHD a vulnerability risk factor for youth homelessness?

Research Question One

According to Ward, et al (1993), a cutoff score on the WURS instrument of 46 or higher correctly identified 86% of patients with ADHD and 99% of normal subjects. Conversely, accordingly to Kessler, et al. (2005), affirmative response to the ASRS-v1.1 6 question-screening instrument has a 68.7% sensitive and 97.9% classification accuracy. In utilizing this cut off methodology, the WURS instrument suggests an overall ADHD prevalence rate of 62% while the ASRS-v1.1 suggests a 92% rate of diagnosis. Study data has been separated into two age cohorts ranging from 18-21 (n=8) and 22-24 (n=16) for further analysis. The data collected on the first age cohort ranging from 18-21 suggests a higher ADHD prevalence rate (WURS 75%; ASRS-v1.1 88%) than the 22-24-age cohort (WURS 56%; ASRS-v1.1 88%).

This higher ADHD prevalence rate amongst the 18-21-age cohort could be due to the relatively small sample size (n=8 out of n=24) or could provide anecdotal evidence-

linking ADHD towards an inclined propensity for youth homelessness. The prevalence rate of ADHD according to WURS amongst males and females in the sample is the same (95%) while the ASRS-v1.1 suggests a high prevalence amongst male subjects (95%). However, females (n=4) sampled were very small in relation to males sampled (n=20), which could be skewing analysis. While this study does not include a nationally representative sample or a large enough sample size to stand as statistically feasible (n=24), the results nonetheless assert the dire importance of undertaking more comprehensive cross-section and longitudinal studies investigating ADHD in relation to the homeless youth population.

Research Question Two

There is a higher prevalence of ADHD in ages 18-21 (WURS 75%; ASRS-v1.1 88%) than ages 22-24 (WURS 56%; ASRS-v1.1 88%). Data suggests a marginally higher rate of ADHD diagnosis in males (ASRS-v1.1 95%; WURS 75%) than females (ASRS-v1.1 75%; WURS 75%). Participants in the 18-21-age cohort experienced an average of 68 days of housing instability while participants in the 22-24-age cohort experienced a proportionally higher average of 278 days of housing instability. In both age cohorts 18-21 and 22-24 there was a 100% prevalence rate of unemployment and substance abuse. The majority of participants were Caucasian (18-24 88%; 22-24 94%; sample mean, 89%) with marginal African-Americans (18-21 13%; 22-24 6%; same mean, 5%) and other identified ethnicities (6%; age cohort 22-24)

Research Question Three

Determining a causative and/or correlative relationship with ADHD as a vulnerability risk factor for youth homeless remains a complex and multi-faceted issue. However, study data suggests a higher rate of ADHD prevalence in youth's aged 18-21 (WURS 75%; ASRS-v1.1 88%), which may suggest that ADHD pathology or symptomatology could be a vulnerability factor influencing youth homelessness. The high ADHD prevalence rate alone of 62% suggests the importance of elucidating further the relationship with ADHD and youth homelessness and exploring any possible linkages with this disorder in the homeless youth population. The hypothesis suggested by Stanford, et al (1999) that ADHD is caused by homelessness rather than the result of homelessness is not supported by data in this study. Thus, further research and inquiry into the youth homeless population is required in order to fully substantiate the hypothesis of this thesis study that ADHD may be a vulnerability factor affecting and/or influencing youth homelessness.

Limitations

This thesis, research and field interviews were completed over a brief seven weeks in the summer. Due to these time constraints and economic limitations, it was exceedingly difficult to recruit eager study participants. Additionally, the time constraints negated a more sophisticated statistical analysis of the study data. This study utilized a relatively small sample size of twenty-four (n=24) and recruitment of studied youths was drawn from the San Francisco Bay Area, which did not allow for a nationally representative sample. Informed consent could not be readily obtained under time

constraints for youths under age 18. While youths under the age of 18 were not encountered to the knowledge of this researcher, such youths would have to be excluded in accordance with informed consent requirements. There may be some questions as to the reliability and validity of WURS and ASRS v1.1 structured survey instruments in determining ADHD diagnosis due to limitations of self-reported details.

Implications and Future Research

This is the first study to exclusively investigate the relationship between ADHD and homeless youth. The high ADHD prevalence rate (62% WURS; ASRS-v1.1 88%) suggests an urgent need to further elucidate the relationship between ADHD and youth homelessness. The hypothesis suggested by Stanford, et al (1999) that ADHD is caused by homelessness rather than the result of homelessness is not supported by data in this study. This hypothesis is not supported since a higher rate of ADHD (WURS 75%; ASRS-v1.1 88%) exists in newly homeless youths aged 18-21 (avg. housing instability 68 days).

Thus further research and inquiry into the youth homeless population is required in order to fully substantiate the hypothesis that ADHD may be a vulnerability factor affecting and/or influencing youth homelessness. This area of research investigating the relationship between ADHD and homeless youth presents a compelling and intriguing underdeveloped area of scholarship. However, research into ADHD in the youth population is arguably fraught with inherent challenges due to the transient nature of the population. Nonetheless, this research is critically necessary for improving homeless

youth welfare, contributing to the socioeconomic success of society and most convincingly as a moralistic imperative.

References

Moore, J. (2005). *Unaccompanied and Homeless Youth Review of Literature (1995 − 2005).* US Department of Education, National Center for Homeless Education. Greensboro, NC: US Dept of Ed.

U.S. Department of Health and Human Services. (2008, October 8). *Runaway and Homeless Youth Act*. Retrieved July 15, 2014, from Family and Youth Services Bureau: http://www.acf.hhs.gov/programs/fysb/resource/rhy-act

Unger, J., Kipke, M., Simon, T., Montgomery, S., & Johnson, C. (1997). Homeless youths and young adults in Los Angeles: prevalence of mental health problems and the relationship between mental health and substance abuse disorders. *Am J Community Psychol., 25* (3), 371-94.

Ward, M. F., Wender, P. H., & Reimherr, F. W. (1993). The Wender Utah Rating Scale: an aid in the retrospective diagnosis of childhood attention deficit hyperactivity disorder. *Am J Psychiatry, 150* (8), 885-890.

Wormer, R. v. (2003). Homeless Youth Seeking Assistance: A Research-Based Study from Duluth, Minnesota. *Child and Youth Care Forum , 32* (2), 89-103.

All Youth Services. (2014, August 1). *Youth 18-24: A Transitional Age*. Retrieved August 1, 2014, from All Youth Services: Advocating for Homeless and At-Risk Youth: http://allyyouthservices.org/youth_homelessness/youth-18-24-a-transitional-age/

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (Vol. 5th ed.). Arlington, VA: American Psychiatric Publishing.

American Psychiatric Publishing. (2013, January 1). *DSM-5 Attention Deficit/Hyperactivity Disorder Fact Sheet.* Retrieved August 2, 2014, from American Psychiatric Assocation: DSM-5 Attention Deficit/Hyperactivity Disorder Fact Sheet

Cauce, A. M., Paradise, M., Ginzler, J. A., Embry, L., Morgan, C. J., Lohr, Y., et al. (2000). The Characteristics and Mental Health of Homeless Adolescents: Age and Gender Differences. *Journal of Emotional and Behavioral Disorders, 8* (4), 230-239.

Crichton, S. A. (1798). *An Inquiry Into the Nature and Origin of Mental Derangement: Comprehending a Concise System of the Physiology and Pathology of the Human Mind. And a History of the Passions and Their Effects* (Vol. 1). London, UK: Strand.

Farone, S. V., Sergeant, J., Gillberg, C., & Biederman, J. (2003). The worldwide prevalence of ADHD: is it an American condition? *World Psychiatry, 2* (2), 104-113.

HUD Exchange. (2014, August 1). *Federal Register: Homeless Definition Final Rules and Regulations.* Retrieved August 1, 2014, from HUD Exchange: https://www.hudexchange.info/resources/documents/HEARTH_HomelessDefinition_finalRule.pdf

Hudson, A., Nyamathi, A., Greengold, B., Slagle, A., Koniak, G. D., Khalilifard, F., et al. (2010). Health-seeking challenges among homeless youth. *Nurs Res. , 59* (3), 208-212.

Hinshaw, S. P., & Scheffler, R. M. (2014). *The ADHD Explosion: Myths, Medication, Money, and Today's Push for Performance.* Newy York, NY: Oxford University Press.

Kessler, R., Adler, L., Ames, M., Jin, R., Secnik, K., Spencer, T., et al. (2005). The World Health Organization adult ADHD self-report scale (ASRS): a short screening scale for use in the general population. *Psychological Medicine* (02), 245-256.

Kocsis, J. G. (2004). *Attention Deficit Hyperactivity Disorder and Homelessness: Is there a connection?* Union Institute and University. Cincinnati: UMI.

Lange, K. W., Reichi, S., Lange, K., Tucha, L., & Tucha, O. (2010). The history of attention deficit hyperactivity disorder. *Atten Defic Hyperact Disord, 2* (4), 241-255.

Larkin Street Youth Services. (2014, August 1). *Housing Programs for Homeless and At-Risk Youth*. Retrieved August 1, 2014, from Larkin Street Youth Services: http://www.larkinstreetyouth.org/programs/housing/

Libertoff, K. (1980). The Runaway Child In America: A Social History. *Journal of Family Issues, 1* (2), 151-164.

Lomas, B., & Gartside, P. S. (1997). Attention-Deficit Hyperactivity Disoder Among Homeless Veterans. *Psychiatric Services, 48* (10), 1331-1333.

National Center for Homeless Education. (2014, August 2). *The McKinney-Vento Definition of Homeless*. Retrieved August 2, 2014, from National Center for Homeless Education: Supporting the Education of Chuldren and Youth Experiencing Homelessness: http://center.serve.org/nche/legis/mv-def.php

National Health Care for the Homeless Council . (2004). *Homeless Young Adults Ages 18–24 Examining Service Delivery Adaptations* . National Health Care for the Homeless Council. Nashville: National Health Care for the Homeless Council.

Nigg, J. T. (2012, May 29). Future Directions in ADHD Etiology Research. *Journal of Clinical Child & Adolescent Psychology*, 524-533.

Slesnic, N. e. (2005). Dual and Multiple Diagnosis Among Substance Using Runaway Youth Read More: http://informahealthcare.com/doi/abs/10.1081/ADA-47916. *The American Journal of Drug and Alcohol Abuse , 31* (1), 179-201.

Smollar, J. (1990). Homeless Youth in the United States: Description and Developmental Issues. *NEW DIRECTIONS FOR CHILD AND ADOLESCENT DEVELOPMT , 1999* (85), 47-57.

Stanford, S., Sandrock, J., Helvie, C., Royal-Stanford, C., & McLaughin, S. (1999). Attention deficit hyperactivity disorder among the homeless. *A.P.H.A. Conference.* Chicago: Paper presented at the A.P.H.A. Conference.

Still, G. F. (1902). The Goulstonian Lectures ON SOME ABNORMAL PSYCHICAL CONDITIONS IN CHILDREN. *The Lancet, 159* (4104), 1163-1168.

Rosler, M., Retz, W., Retz-Junginger, P., Hengesch, G., Schneider, M., Supprian, T., et al. (2004). Prevalence of attention deficit–/hyperactivity disorder (ADHD) and comorbid disorders in young male prison inmates. *European Archives of Psychiatry and Clinical Neuroscience, 254* (6), 365-371.

Tables and Figures

Quantitative Results

The WURS forms were hand tabulated and each raw score were entered into a CVS spreadsheet. An affirmative response to one or more questions in the gray screening section on the ASRS-v1.1 was recorded as an ADHD diagnosis. Data values were thoroughly checked for accuracy. The data from the CVS file was then imported into the R-Studio statistical package version 0.98.978. A cursory statistical analysis was performed since time restrictions negated a more sophisticated statistical analysis.

Table 1

Participants qualifying for ADHD diagnosis by WURS 46 cutoff score or higher and ASRS-v1.1 one or more affirmative responses and age cohort

	Younger Cohort (18-21 yrs)		Older Cohort (22-24 years)	
WURS Diagnosis	n=6	75%	n=9	56%
ASRS-v1.1 Affirm. Resp.	n=7	88%	n=14	88%
Total Participants	n=8	100%	n=16	100%

According to Ward, et al (1993), a cutoff score on the WURS instrument of 46 or higher correctly identified 86% of patients with ADHD and 99% of normal subjects. Conversely, accordingly to Kessler, et al. (2005), affirmative response to the ASRS-v1.1 6 question-screening instrument has a 68.7% sensitive and 97.9% classification accuracy.

Table 2

Participant ordered by sex, WURS ADHD diagnosis (46 or higher cut off score) and ASRS-v1.1 one or more affirmative responses

	Male		Female	
WURS Diagnosis	n=15	75%	n=3	75%
ASRS-v1.1 Affirm. Resp.	n=19	95%	n=3	75%
Participant Total	n=20	100%	n=4	100%

Table 3

Participants by WURS diagnostic status, ASRS-v1.1 one or more affirmative responses, average number of days experiencing housing instability in the last 365 days and age cohort

	Younger Cohort (18-21 yrs)	Older Cohort (22-24 years)
WURS Diagnosis	75%	56%
ASRS-v1.1 Affirm. Resp.	88%	88%
Avg. Housing Instability	68 days	278 days
Total Participants	n=8	n=16

Table 4

Participants by sex and age cohort

	Younger Cohort (18-21 yrs)	Older Cohort (22-24 years)
Male	50%	100%
Female	50%	0%
Total Participants	n=8	n=16

Table 5

Participants by employment status, substance abuse affirmation, ethnicity and age cohort

	Younger Cohort (18-21 yrs)	Older Cohort (22-24 years)
Substance Abuse Affirm.	100%	100%
Employed	0%	0%
Self-Employed	0%	0%
Unemployed	100%	100%
Ethnicity Caucasian	88%	94%
Ethnicity African-American	13%	6%
Ethnicity Other	0%	6%
Total Participants	n=8	n=16

Figure 1: Age distribution

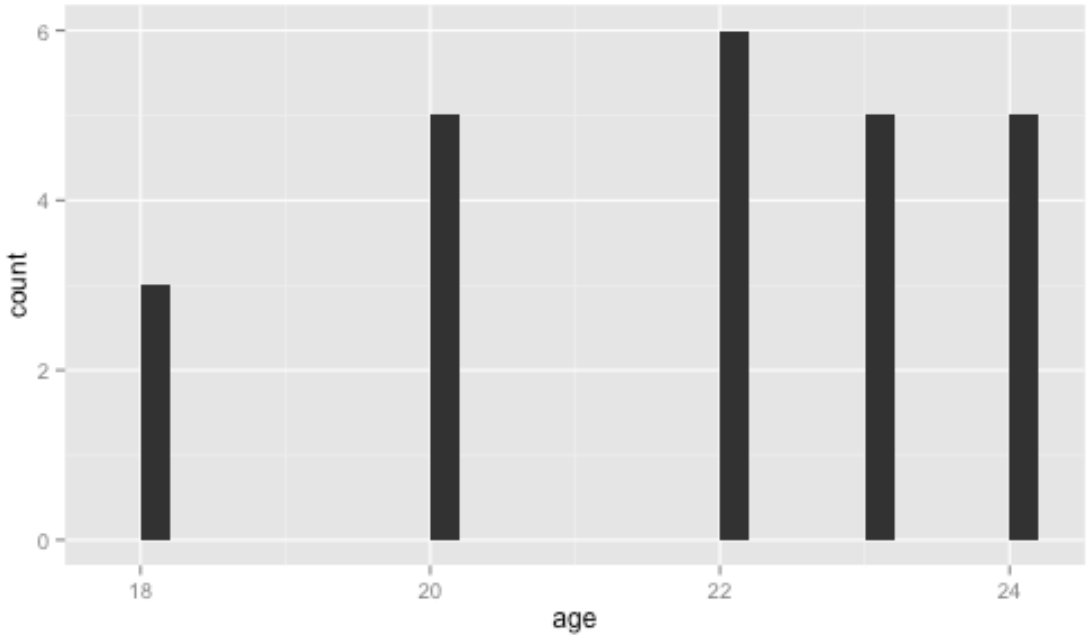


Figure 2: Housing instability in the last 365 days in relation to age

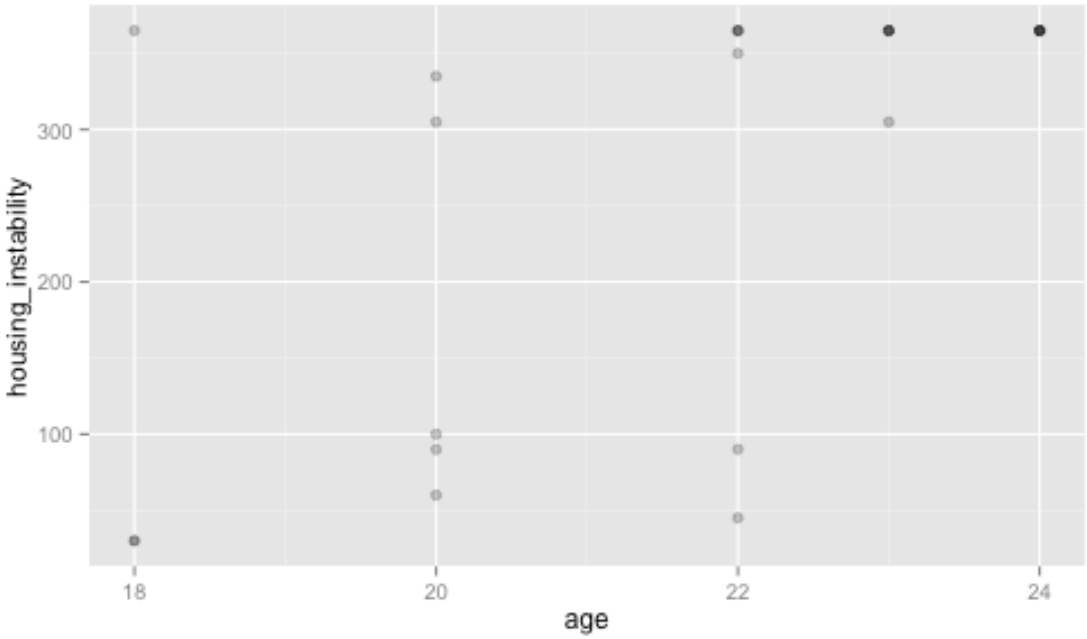


Figure 3: WURS diagnostic score distribution in relation to age

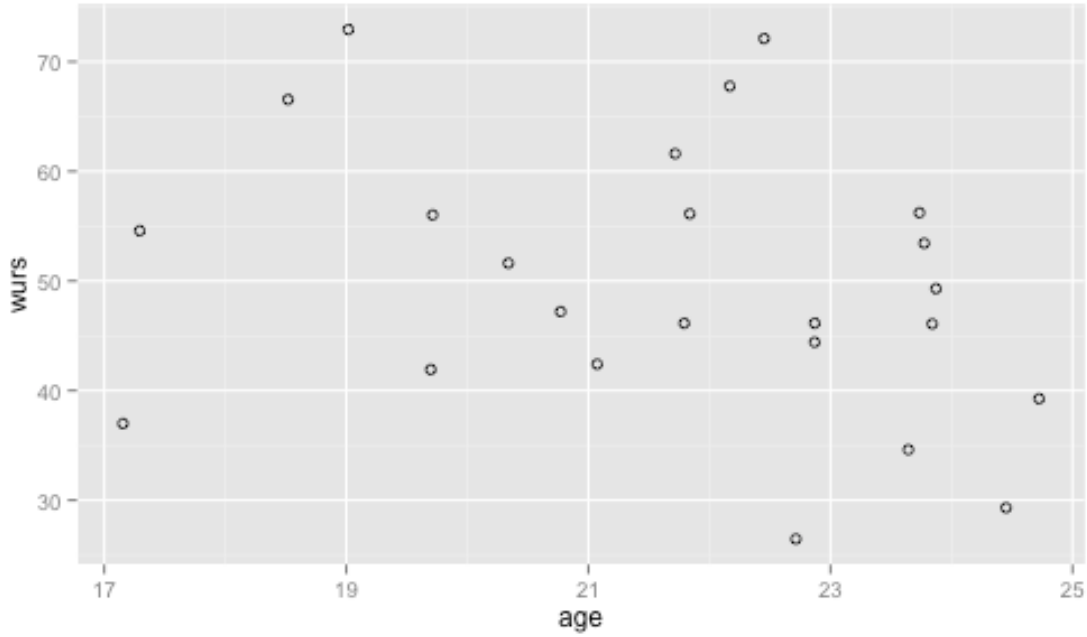
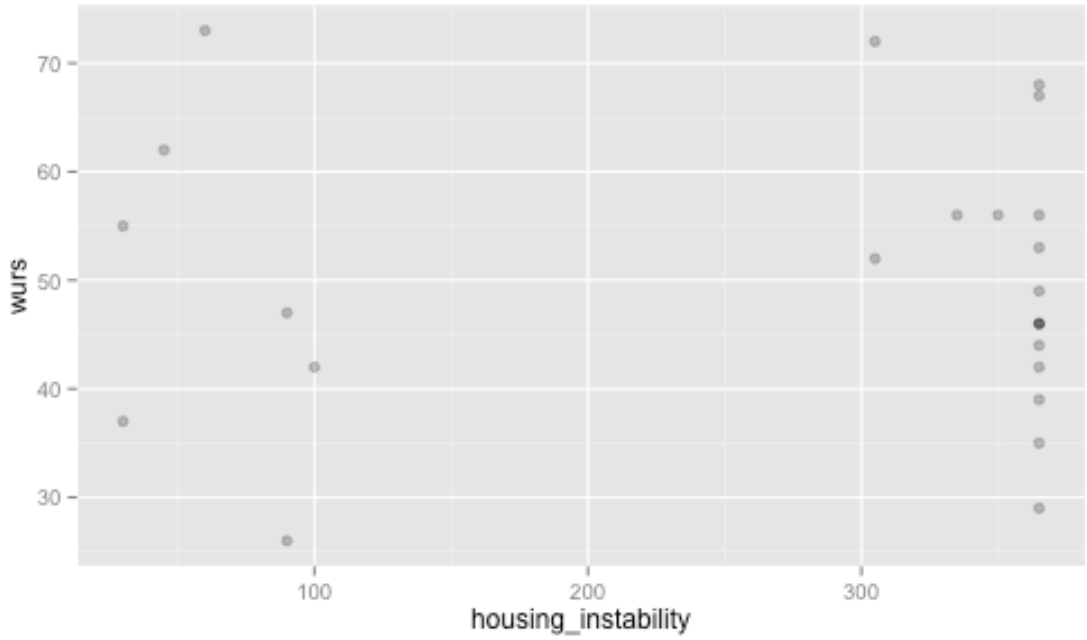


Figure 4: WURS diagnostic score in relation to number of day's participant experienced housing instability in the last 365 days



Appendix A

Structured Interview

1. What is your age? Possible answers: 18-24: _____

2. What is your ethnicity? White, Black/African-American, Asian, Hispanic/Latino, Native Hawaiian/Pacific Islander, Native American

3. What is your gender?
Male or Female

4. What is your marital status?
Single, Married, Never Married

5. What is your employment status?
Employed, Unemployed, Disabled

6. Have you used any substances in the last 12 months?
Yes or No

7. How many days in the last 12 months have you experienced housing instability?
Possible answers range from: 1-365 days _____

Appendix B

Consent Form

University of California, Berkeley – Research

INFORMED CONSENT FORM FOR RESEARCH PARTICIPANT

Information Sheet

Purpose of the Study. As part of the requirements for a degree at UCB, I have to carry out a research study. The study is concerned with Attention Deficit Hyperactivity Disorder (ADHD) in youth homeless and runaway populations in the San Francisco Bay Area.

What will the study involve? The study will involve providing basic demographic information such as age, sex, ethnicity and the administration of two surveys to determine ADHD diagnosis.

Why have you been asked to take part? You have been asked because you have been determined to be homeless and a "youth" between ages 18-24.

Do you have to take part? No, your participation is completely voluntary. You can discontinue participation at any time. You may request withdraw from the study up to 2 weeks after participation.

Will your participation in the study be kept confidential? Yes. I will ensure that no clues to your identity appear in the study. Any extracts from what you say that are quoted in the thesis will be entirely anonymous.

What will happen to the information that you give? Your name and other sensitive identifying information will not be collected. The remaining data will be kept confidential for the duration of the study. On completion of the thesis, they will be retained for a further six months and then destroyed.

What will happen to the results? The results will be presented in my thesis. My thesis advisor, a second reader and possibly an external examiner will see them. Future students on the course may read the thesis. The study may be published in a research journal.

What are the possible disadvantages of taking part? I don't envisage any negative consequences for you in taking part. It is possible that talking about your experience in this way may cause some distress.

What if there is a problem? At the end of the interview, I will discuss with you how you found the experience and how you are feeling. If you subsequently feel distressed,

you should contact Larkin Street Youth Services for assistance and referrals. I will assist you with making contact if necessary.

Who has reviewed this study? My thesis advisor/supervisor must give approval/consent before relevant research can be undertaken. The committee for protection of human subjects (CPHS/OPHS) protocols must also be followed in accordance with University policy.

Your compensation for completing the study is: _____.

.

Any further queries? If you need any further information, you can contact me by email at bharding@berekeley.edu or 310-427-1520.

If you agree to take part in the study, please provide only your initials on the consent form.

Consent Form

I (Initial here)……agree to participate in Blake Harding's research study.

The purpose and nature of the study has been explained to me in writing.

I am participating voluntarily.

I give permission for my interview with Blake Harding to be tape-recorded

I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.

I understand that I can withdraw permission to use the data within two weeks of the interview, in which case the material will be deleted.

I understand that anonymity will be ensured in the write-up by disguising my identity.

I understand that disguised extracts from my interview may be quoted in the thesis and any subsequent publications if I give permission below:

(Please circle response)

I agree to quotation/publication of extracts from my interview

I do not agree to quotation/publication of extracts from my interview

Initialed……. Dated…….

Appendix C 1

Survey Instrument ASRS-v1.1: Sample Questions

Item #	Question
4.	When you have a task that requires a lot of thought, how often do you avoid or delay getting it done?
10.	How often do you misplace or have difficulty finding things at home or work?
14.	How often do you have difficulty unwinding and relaxing when you have time to yourself?
18.	How often do you interrupt others when they are busy?

Appendix C 2

Survey Instrument WURS: Sample Questions

Item #	Question
6.	inattentive daydreaming
14.	not getting a kick out of things dissatisfied with lfife
17.	irritable
24.	acting with out thinking impulsive
30.	poorly coordinated, did not participate in sports
38.	difficulty getting awake
43.	headaches
50.	overall a good student fast
60.	repeating grades

Appendix D

Recruitment/Interview Protocols

Recruitment Screening Steps

1. Approach and introduce self to potential study participant/youth in "hang out" area
2. Determine youth runaway/homeless status
3. Determine if aged between 18-24 years
4. Explain briefly that I'm researching ADHD in relation to youth homelessness/runaways in the San Francisco Bay Area as part of my degree requirements for my thesis
5. Confirm verbally youth would like to participate
6. If youth verbally confirms, then proceed to interview

Interview Protocols

1. Provide informed consent
2. Designate private participant number ranging from 1-100
3. Discuses any questions/concerns before proceeding ahead
4. Administer structured survey instrument to capture demography and brief experiential data
5. Explain possible question responses for ASRS v1.1 survey instrument
6. Administer ASRS-v1.1 survey instrument
7. If interviewee answers in the affirmative to one or more questions of the six (6) screening questions, then proceed to questions seven (7) through eighteen (18).
8. Explain possible question responses for WURS survey instrument
9. Administer WURS survey instrument
10. Thank the interviewee for their valuable time
11. Inquire if they are any further questions/concerns
12. If concern/distress is indicated refer youth to Larkin Street Youth Services for further referral and/or support