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HISTORICAL TRAUMA AND HEALTH OUTCOMES

A Meta-Analysis of the Correlation Between Historical Trauma and Health Outcomes in the Native American Population

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Psychology

By

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Abstract

Native Americans experience significant health disparities such as increased rates of cardiovascular disease, diabetes, and mental illness. Recent research has suggested that historical trauma may be a contributing factor. This meta-analysis examined the association between historical trauma and health outcomes in Native Americans in the United States and Canada. Data from 14 studies ($N = 14,698$, 35 effect sizes) examining the physical health, mental health, and substance use domains and using the Historical Loss Scale were collected for analysis. Possible moderating factors were also examined. Overall, a small, significant association ($r = .124$) was found between historical trauma and health outcomes. The association was significant for mental health outcomes ($r = .181$), but not physical health ($r = .169$) or substance use ($r = .038$). Effect sizes were not moderated by age group, gender, or reservation residency. Findings largely support the theory of historical trauma as a contributor to health inequities. Future research is necessary, and should be expanded to further test the Historical Loss Scale, collect more health outcome data, and survey Native Americans across the United States.

Key words: historical trauma, health outcomes, colonization, Native Americans

A Meta-Analysis of the Correlation Between Historical Trauma and Health Outcomes in the Native American Population

The current state of health for Indigenous peoples cannot be fully understood without knowing the context of their history. Since Europeans discovered the New World, Native Americans have been victims of war, genocide, and rape. These events have torn them from their land and culture, inciting trauma that has lasted for generations. Indigenous historical trauma is characterized by the generational transmission of colonization, forced removal from lands, loss of culture, and unresolved grief (Walters, 2011). Understanding the intersection of the past and present is becoming more important in Native American communities as the effects of the history have had a drastic impact on the present. The systematic genocide of the Native American way of life is foundational to their history and contributes to the discrimination and stereotypes of the modern Native American (Brave Heart, 2003). The dysfunctional social patterns, including changes in family structure and community cohesiveness, that have been created to cope with this chronic trauma are transferred as standard behavior across generations.

Indigenous populations suffer from the greatest mental and physical health disparities than any other ethnic group in the United States (Lewis, 2018). Life expectancy of Native Americans is 71.8 years, around 5.5 years less than that of all other races in the United States (Solomon et al., 2022). Furthermore, Native Americans continue to record the highest rates of cardiovascular disease, diabetes, suicide, assault, cancer, and other chronic health condition incidence (Arthur, 2020). Despite progress being made in recognizing the sovereignty of Native peoples, the healthcare guaranteed to tribes in treaties in exchange for millions of acres of land shows stark, chronic disparities. The history of these disparities provides valuable context to the numerous problems affecting Native American health policy in the United States, many of them

being linked to inadequate health and medical education, disproportionate poverty rates, discrimination in healthcare services, and ignorance of cultural differences.

While the low socioeconomic status of Native Americans greatly contributes to poor health among the population, it does not explain the significantly higher rates of poorer health in comparison to non-Indigenous peoples (Lewis, 2018). Many of these disparities are theoretically linked to land loss, inadequate living conditions, and cultural destruction through the theory of historical trauma (Walters et al., 2011). The traumatic physical effects of removal and assimilation are glaringly evident in the modern Native American population through physical manifestations of lower life expectancy and disproportionate disease burden. The concept of historical trauma provides context for the poor health outcomes in the Native American population.

The Native American Population

Native Americans make up around 2.6% of the United States population, with at least 8.75 million people identifying as partially American Indian or Alaskan Native (U.S. Census Bureau, 2021). The U.S. government officially recognizes 574 Native American tribes in the continental United States and Alaska, each with their own unique traditions and practices. These tribes are eligible for federal funding and services from the Bureau of Indian Affairs, including Indian Health Services. Approximately 56.2 million acres of land are held in trust by the United States government for use by Native American tribes and individuals, including 326 land areas dedicated as reservations, according to the Bureau of Indian Affairs (U.S. Department of the Interior, Indian Affairs). However, Native American populations are no longer concentrated in these areas, with 78% of the people residing outside of reservations. Some reservations are on or

near the land the tribe originally inhabited, but many are the result of forcible relocation by the federal government.

Indigenous peoples face significantly more stressors in terms of health, living conditions, and rates of discrimination when compared to the general population. This has been reinforced throughout history in the five stages of United States government policy towards Native Americans: removal, reservations, reorganization, termination, and self-determination (Burhansstipanov, 2000). The federal government was empowered to forcibly remove Native Americans from their tribal lands and relocate them west of the Mississippi River through Andrew Jackson's Indian Removal Act of 1830 (Drexler, 2019). Most notably, this resulted in the relocation of the Cherokee people, known commonly as the "Trail of Tears". The population was restricted further to reservation lands through the Indian Appropriations Act of 1871. This was one step in eliminating the sovereignty of Native peoples, taking away their right to treaties and making them "wards of the state." In 1934, the federal government began the process to preserve and protect Native American lands and resources, including the establishment of the Indian Health Service (IHS) in 1955 (Jones, 2011). Autonomy over these resources and programs was given to Native American tribal leadership in the Self-Determination Era. Significant progress has been made, especially in terms of healthcare, but disparities persist (Jones, 2011).

Historical Trauma

Historical trauma is a term used to describe the intergenerational transmission and experience of trauma that was forced upon a group of people with a specific identity or affiliation such as a nationality, religious affiliation, or ethnicity (Ehlers et al., 2013). It was first applied in the 1960s to try to explain the collective trauma sustained by Jewish Holocaust survivors (Ehlers

et al., 2013). This concept has been expanded to include African Americans, Armenian refugees, Japanese American survivors of internment camps, Indigenous peoples, and many other marginalized groups that share a history of oppression and trauma exposure (Mohatt et al., 2014). The concept is understood as consisting of three elements: (1) a “trauma” or “wounding,” (2) shared by a group of people, and (3) spanning across multiple generations such that members of the group may experience trauma-related symptoms without being present for the trauma (Mohatt et al., 2014). This is distinct from intergenerational and collective trauma as its effects reach to an entire group instead of just a familial unit, and has roots through history; however, a collective trauma has the ability to become a historical trauma after an extended period of time. Due to the degree of trauma it describes, the concept offers an explanation for continual inequities in health and well-being for all applicable populations (Kirmayer et al., 2014).

The Historical Loss Scale (HLS) is a standardized measure that assesses the frequency with which Indigenous individuals think about the losses to their culture, land, and people as a result of European colonization (Armenta et al., 2015). The scale was created by Whitbeck et al. (2004) through focus groups with Native American elders in which the kinds of losses related to historical trauma and the emotions associated with them were recorded. These focus groups, combined with discussions with reservation advisory boards and other tribal members, determined the topics on the scale. The purpose of the HLS is to assess the prevalence and immediacy of thoughts related to historical loss (Whitbeck et al., 2004). The HLS includes 12 items of historical loss such as “loss of our land,” “loss of language,” “loss of traditional spiritual activities,” and “loss of our people through early death” (Gone et al., 2019). It has high internal consistency with a Cronbach’s alpha of .92 (Whitbeck et al., 2004). The Adolescent Historical Loss Scale was adapted from the HLS by Whitbeck et al. (2009) and excludes two items that

specifically reference adult roles to be more representative of adolescent experiences. This scale also has high internal consistency (Cronbach's alpha = .91) (Whitbeck et al., 2009).

A secondary scale, the Historical Loss Associated Symptoms Scale (HLASS), was created to focus on the feelings associated with historical loss (Whitbeck et al., 2004). From discussions with the focus groups, it was discovered that the items associated with historical loss were also associated with emotion (Whitbeck et al., 2004). The purpose of the HLASS is to identify emotional responses triggered when historical loss or historical loss indicators are brought to mind (Whitbeck et al., 2004). The HLASS includes 12 items describing reactions towards historical loss such as "anxiety or nervousness," "sadness and depression", and "anger" and has high internal consistency (Cronbach's alpha = .89) (Gone et al., 2019, Whitbeck et al., 2004).

Historical Trauma and Health Outcomes in Native Americans

In the context of Indigenous peoples, the theory of historical trauma was introduced in the 1990s to clinical and health sciences to contextualize and account for the extremely high rates of health disparities and psychological distress (Gone et al., 2019). Brave Heart et al. (1998) first outlined the concepts of "historical unresolved grief" and "historical trauma" to understand the social problems facing the population. These terms have further been used to describe the impact of colonization and cultural suppression throughout generations. Hartmann and Gone (2014), have summarized the concept of Indigenous historical trauma through colonial injury, collective experience, cumulative effects, and cross-generational impact. Colonial injury describes the conquest and subjugation by European settlers. Collective experience is translated to Indigenous communities that have been negatively affected by the injury through the forcible action of colonizers. Cumulative effects of the initial interaction have grown to become systems

of discrimination and oppression through government policies and practices. Finally, cross-generational impact describes the generational transfer of these injuries as “risk and vulnerability” to the population today. Reservation life and loss of language, land, traditional practices, and family structures are daily reminders of the ethnic cleansing the population was subject to (Whitbeck et al., 2004).

The theory of historical trauma also accounts for the current psychological, social, environmental, and physiological stressors present in Native American communities. Since the losses are historical, it examines the present symptoms related to those losses. In America, Native American people report higher rates of serious psychological distress, up to 2.5 times more than the general population, over a month-long period (Mangla, 2022). Furthermore, suicide rates for Native American adolescents are more than double that of their white counterparts (Mangla, 2022). Compared with white Americans, Native Americans have a higher prevalence of obesity (76.7%), diabetes (21.4%), and hypertension (32.9%) (Adakai et al., 2018). Furthermore, they also have higher uninsured rates and significant barriers to obtaining care. By any measure, it is evident that Native American healthcare lacks when compared with other groups, despite the obligation of the US government to provide healthcare for the population.

Current Study

There is a growing theoretical interest in understanding how adverse health effects may be related to the symptoms of historical trauma in the population. However, one of the greatest barriers to understanding more is the lack of research surrounding the topic. Overall, this topic is not well studied. There are few articles that examine the association between historical trauma and health outcomes, though researchers have emphasized the need to publish more research. Historical trauma has been found to impact health in terms of family violence and major life

stressors (Walls and Whitbeck, 2011). Other studies among Canadian First Nations Indigenous peoples with family history of boarding school attendance and removal from one's family and community were associated with suicidal ideation and attempts (Elias et al., 2012) and current symptoms of depression (Bombay et al., 2011). However, research has not been able to observe correlations for a variety of different health outcomes.

This meta-analysis sought to address gaps in the literature concerning the connection between the two in the Native American population. The articles examined in this meta-analysis had varying associations between historical trauma and health outcomes and used cross-sectional designs. The current study sought to determine if there is a clear association between historical trauma and health outcomes among Native American populations. Historical trauma was measured using the Historical Loss Scale and health outcomes were measured using the appropriate scale determined by the article's authors. This study examined health within three domains: physical, mental, and substance use. Other moderating factors examined included age, gender, reservation residence, and other study characteristics. Given the background associating high levels of historical trauma with poorer health outcomes in Native Americans, I expected to find a positive correlation between the two.

Method

Inclusion Criteria

A literature search was conducted to find studies with the following criteria: (a) the study included a sample consisting of American Indian and Alaskan Native (AI/AN) persons in the United States and Canada, (b) the study included quantitative data for the variables of interest, (c) the study included the Historical Loss Scale (HLS) or Adolescent Historical Loss Scale (AHLS) as the measure of historical loss, (d) the study included a measure for physical health,

mental health, and/or substance use, and (e) the study was published in a peer-reviewed journal or was a dissertation. Studies that measured historical loss broadly, without the use of the HLS, were excluded. Other studies excluded were those that examined other correlations, such as historical loss and another principal variable besides health outcomes.

Variables Extracted

Historical Trauma

The primary independent variable examined was historical trauma, defined as the quantitative value of the frequency with which Indigenous individuals think about historical loss (Armenta et al., 2015). This was measured using the Historical Loss Scale as designed by Whitbeck et al. (2004). Studies that used the Adolescent Historical Loss Scale were also included.

Health Outcomes

The primary dependent variable examined was health outcomes, defined as the quantitative index of symptoms of poor physical or mental health, or substance use. Studies were coded for the methods and measures that the authors used in their articles. Health outcomes were limited to three domains: physical health, mental health, and substance use.

Moderators

In addition to the primary variables of historical trauma and health outcomes, other moderating variables were recorded. The moderators included gender (proportion of the sample that identified as male, female, or did not disclose), age group (adolescent or adult), and reservation residence (proportion of the sample currently living in an area of land held and governed by a federally recognized Native American tribal nation).

Search Strategy

A literature search was completed using the following databases: CINAHL Complete, Medline Complete, APA PsychInfo, through EBSCOHost and PubMed. The Boolean search terms were: "historical loss scale" AND "Native American" OR "American Indian" OR "indigenous" OR "native tribe" OR "native people." The search included journal articles, dissertations/theses, books, meta-analyses, and other publications. Any reports in languages other than English were not included in this meta-analysis. The search was not limited to a specific time frame; however, the HLS was not developed until 2004, so all studies were published after that year.

The search yielded 48 studies (Figure 1). Of these 48, 14 were discarded because they were duplicates. The abstracts of the remaining 34 studies were reviewed to see if they met the criteria for inclusion. In total, two were excluded because they were books, four were excluded because they were qualitative studies or review papers, and one was unable to be accessed. After reading the abstracts and methods section of the remaining articles, three were excluded because they did not have a measure for health outcomes, and six were excluded because they did not focus on historical trauma and/or used the HLS. After reading the remaining articles, three studies were excluded for using the same sample and reporting the same data.

The final sample for in-depth coding was 15 studies. All reported primary data. When studies reported multiple effect sizes for different subscales of the same measure, these effect sizes were recorded. Therefore, 15 studies were used for effect size extraction, and 36 effect sizes were recorded.

Coding Procedure

Each study was coded by the author, an undergraduate honors psychology student. The coding procedure was based off the guidelines outlined by the author's advisor, a PhD clinical

psychologist. Three of the articles were coded by both the undergraduate student and a graduate assistant enrolled in the clinical psychology doctoral program to verify accuracy of coding. After that, each article was coded independently by the undergraduate student, discussing any questions with the graduate assistant and advisor. The advisor reviewed the coding for a few studies to ensure accuracy in the coder's work.

Effect sizes were able to be extracted directly from many of the studies ($n = 14$). One author was emailed and asked to provide the correlation needed from their article's data. The author stated that they would look into the data to try to provide the correlation, but did not respond before data analysis.

Statistical Method

The primary effect size measure used for the purposes of this meta-analysis was the Pearson product-moment correlation. All effect sizes that were not provided as a Pearson correlation (e.g., odds ratios, R-squared values) were converted into a Pearson correlation using Huse Lin's effect size converter (<https://www.escale.site/>). All other conversions were made using Wilson's practical meta-analysis effect size calculator (<https://www.campbellcollaboration.org/escalc/html/EffectSizeCalculator-R2.php>).

At least one effect size was extracted per study. If studies included more than one effect size for different subscales of the same health outcome measure, all were included for analysis. This resulted in 35 effect sizes for 14 studies. Results are summarized in Table 1.

Results

Descriptive Statistics

A total of 14 studies were included in this meta-analysis ($N = 14,698$, range: 120 – 1265) with a total of 35 effect size estimates. Thirteen of the studies (92.9%) used convenience

sampling methods when recruiting participants and all studies (100%) obtained their associations through cross-sectional data. Thirteen of the studies (92.9%) were also published in a peer-reviewed journal; one was a dissertation.

Five of the studies (35.7%) included information about tribal affiliation, representing the following tribes: Cherokee, Kiowa, Diné/Navajo, Apache, Comanche, Sioux, Assiniboine, Lumbee, Kettle, and Strong Point First Nation. Data about reservation residence was also collected, with 10 studies (71.4%) indicating that their sample included reservation residents. Five of the studies (35.7%) used the Adolescent Historical Loss Scale, accounting for 11 of the 35 effect sizes (31.4%).

Most of the effect sizes ($n = 17$, 48.6%) were associations with the mental health domain. Measures for this domain included the Tri-Ethnic Center for Prevention Research - Anxiety measure ($n = 5$, 29.4%), Center for Epidemiologic Studies – Depression Scale ($n = 5$, 29.4%), the Family History Assessment Module ($n = 1$, 5.88%), Tri-Ethnic Center for Prevention Research - Self-esteem measure ($n = 1$, 5.88%), Tri-Ethnic Center for Prevention Research - Depressive symptoms measure ($n = 1$, 5.88%), Tri-Ethnic Center for Prevention Research - Anger measure ($n = 1$, 5.88%), the Posttraumatic Checklist ($n = 1$, 5.88%), the Perceived Stress Scale-10 ($n = 1$, 5.88%) and the Hopelessness Depression Symptom Questionnaire - Suicidality Subscale ($n = 1$, 5.88%).

Four effect sizes (11.4%) were associations with the physical health domain. Measures for this domain included the Center for Epidemiologic Studies – Depression scale ($n = 1$, 25%) (structured in a way where authors only used items related to somatic complaints for analysis), the Binge Eating Scale ($n = 1$, 25%), and sexual risk behaviors ($n = 2$, 50%) defined as sex with multiple concurrent partners ($n = 1$, 25%) and inconsistent condom use ($n = 1$, 25%).

Finally, 14 effect sizes (40%) were associations with the substance use domain. Measures for this domain included the Substance Abuse and Mental Health Service Administration (SAMHSA) survey ($n = 5$, 35.7%), the Timeline Followback ($n = 4$, 28.6%), the Youth Risk Behavior Surveillance Survey ($n = 2$, 14.2%), the Semi-Structured Assessment for the Genetics of Alcoholism ($n = 1$, 7.14%), the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) ($n = 1$, 7.14%), and frequent marijuana use ($n = 1$, 7.14%) defined as using marijuana more than once a week.

Overall Effect Sizes

In order to determine the association between historical trauma and health outcomes in the Native American population, I used “Fitting three-level meta-analytic models in R: A step-by-step tutorial” with the metafor package in R Studio (Assink & Wibbelink, 2016). The mean effect size was $r = .124$ (95% confidence interval: .058, .191), $t(34) = 3.78$, $p < .001$. This indicates that there is a significant positive association between historical trauma and health outcomes in Native American populations. Results are summarized in Figure 2. Furthermore, the results for the test of heterogeneity reveal significant variation between all effect sizes in the data set. When calculating the distribution of total variance across the three levels, 16.03% of the total variance can be attributed to variance at level 1 (i.e., within-study sampling variance). A total of 38.02% of the variance can be attributed to variance at level 2 (i.e., different effect sizes from the same study sample). Finally, 45.78% of the total variance in effect sizes can be attributed to variance at level 3 (i.e., differences between studies). Therefore, I examined potential moderators of the overall association.

Moderation Analyses: Participant Characteristics

Age. Age was determined by which version of the Historical Loss Scale (HLS) the study utilized to determine age divisions. Use of the Adolescent Historical Loss Scale (AHLS) indicated an adolescent sample population; use of the HLS indicated an adult population. There was no significant difference in effect size estimates for studies that utilized the HLS versus the AHLS: $F(1, 33) = 0.05, p = .829$. Therefore, the overall effect was similar across age groups.

Gender. Gender analyses were calculated based off the proportion of female participants in the sample of the studies. Studies that indicated a female participant percentage of greater than 50% were determined to have a female participant majority. Studies that indicated a female participant percentage of less than 50% were determined to have a female minority. There was no significant difference in effect size estimates for gender: $F(1,33) = 0.09, p = .773$. Therefore, the overall effect was similar for studies with majority men and studies with majority women.

Reservation residence. Reservation residence analyses were calculated similarly to gender analyses. Reservation residence was calculated based off the proportion of participants that indicated living on a reservation. Studies that indicated reservation residence of greater than 50% were determined to have a reservation residence majority. Studies that indicated reservation residence of less than 50% were determined to have a reservation residence minority. It is important to note that only three studies did not provide reservation residence data. There was no significant difference in effect size estimates for reservation residence: $F(1,27) = 1.35, p = .255$. Therefore, the overall effect was similar for studies with majority participants living on reservations and studies with majority participants living off reservations.

Moderation Analyses: Variable Characteristics

Health Outcomes. A significant difference was found in effect size estimates for the different health domains: $F(2,32) = 5.80, p = .007$. The mean effect size for studies ($k = 17$) in the mental health domain was $r = .181$ (95% confidence interval: .114, .248), and this effect was significantly different from zero: $t(16) = 5.73, p < .001$. Results are summarized in Figure 3. The mean effect size for studies ($k = 4$) in the physical health domain was $r = .169$ (95% confidence interval: -0.115, .453); however, this effect size did not significantly deviate from zero: $t(3) = 1.89, p = .155$. Results are summarized in Figure 4. The mean effect size for studies ($k = 14$) in the substance use domain was $r = .038$ (95% confidence interval: -.069, .145), and was not significantly different from zero: $t(13) = 0.77, p = .454$. Results are summarized in Figure 5.

Assessment of publication bias. To assess for publication biases from the articles used in this meta-analysis, a funnel plot was constructed. A funnel plot is a scatterplot used in meta-analyses to visually detect publication bias, as significant findings are more often published than non-significant ones. After plotting the effect sizes of the studies in R, I was able to determine that there was no publication bias. Results are summarized in Figure 6.

Discussion

The current meta-analysis investigated the association between historical trauma and health outcomes in the Native American population. Results indicated that there was a small but significant, positive association between the two variables. Specifically, it was found that mental health is more likely to be associated with historical loss; however, the same was not true for indicators of physical health and substance use. The relationship between historical loss and health outcomes was not moderated by sample characteristics. This greatly contributes to the

need for a larger body of literature focused on the impact of historical loss on the Native American population.

Overall, there was a significant association between historical loss and health outcomes. In other words, the degree to which someone is aware of and reflects on historical losses is associated with poorer health indicators in Native American populations. This effect was stronger concerning the mental health domain. These results are consistent with the general beliefs of Native American peoples and the majority of the research that has been conducted concerning the theory of historical trauma (Mohatt, 2014). These results imply that the more symptoms of historical trauma, such as loss of land and loss of people to early death, the more likely Native Americans are to experience poor symptoms of mental health, such as anxiety and depression.

As previously mentioned, there was no significant association between historical loss and physical health. However, there were very few studies of historical loss and physical health (only four), and three of the four showed a significant and positive association between historical loss and negative health behaviors. The one effect size that was not different from zero, inconsistent condom use, may be an indication that people who engage in more risky sex are also more likely to protect themselves.

Finally, the results showed that historical loss is not significantly associated with substance use. As shown in Figure 5, the majority of the average effect sizes were around zero. This combats the stereotypical narratives of increased Native American substance use as a result of colonization. This shows that Native Americans may not turn to substances to cope with their poor mental health or when they are confronted with symptoms of historical loss. Instead, other

factors may account for high rates of substance use in the Native population, such as lack of economic opportunities

Participant characteristics were not found to moderate the association between historical loss and health outcomes. This study selected age, gender, and reservation residence for further study. Average age was determined using the Adolescent Historical Loss Scale. This variable was determined to not influence the association, indicating that these effects are consistent across age groups. This speaks to the emphasis on community and influence of elders in Native American culture. In Native American communities, the institution of family expands beyond bloodline, encapsulating the entire tribe as part of the larger “family”. This social connectedness is essential for the healing and stability of Native communities, but has been permanently changed by the continual influence of colonization. Furthermore, elders are a pillar in the culture. They are viewed as protectors, mentors, and “intergenerational transmitters of cultural knowledge” (Whitewater et al., 2016). They are essential in shaping the identity and behaviors of Native American peoples (Whitewater et al., 2016). As figures of great importance in the community, elders stand as an example of strength against historical trauma to the younger generations. However, with the COVID-19 pandemic, the rate of elder death has reached critical highs, accompanied by the rapid decline of fluent Indigenous language speakers. This “cultural crisis” is the direct result of a poorer quality health system and generations of harm (Healy & Blue, 2021). This will greatly shift the outlook of Native tribes in the future and may cause stronger feelings of historical loss, as language loss is an item on the Historical Loss Scale.

Furthermore, gender had no effect on the association. Female participants were used as the reference point, but the results indicated that the association equally affects Native men and women. These results are interesting due to the prominent role women have in Native American

culture. Native Americans operate as a matriarchal society, with women being honored as a source of new life and for providing balance and harmony to the community (Shoemaker, 1995). As a result, women were seen as sources of strength in the home, political realm, and greater community. Arguably, they took on the burden of the wellbeing of the group, which would reflect a greater degree of historical trauma in the group. However, cultural assimilation shrank the scope of female influence in Native American society, which may provide background to the given results (Shoemaker, 1995).

Finally, location was also found to not moderate the association between historical loss and health outcomes. All but three studies ($n = 11$) collected reservation residence data for their sample. These results imply that historical loss affects health outcomes both on and off reservations; this effect is not further emphasized by the poor life conditions on reservations. This point is particularly important as one may believe that association of historical trauma and therefore, poor health outcomes, would be stronger in a location with a concentrated Native American population. However, the results of this meta-analysis do not reflect that. It is important to determine if this is true and applicable across the population through further study.

While the examined variables were not found to influence the association investigated, they do speak to the validity of the historical trauma theory. It works to capture the expansiveness of the consequences of colonization and how it helped cripple nations of peoples. Trauma is blind to boundaries of age, gender, and location because of the ruthlessness of its wielder.

Limitations

This meta-analysis had several limitations, the main one being the lack of a large and diverse research bank to study. It was difficult to find enough articles to produce significant

correlations for the variables examined. This echoes the plead for more research across all studies. Furthermore, this topic lacks diversity in research design, sample collections, demographics, and variables under investigation due to its relative novelty. The Historical Loss Scale itself is only 19 years old, having been recently developed in 2004, by Whitbeck et al. (2004).

This meta-analysis examined articles that almost exclusively utilized cross-sectional design and convenience sampling to structure their studies. Therefore, it was unable to definitively determine how historical loss continues to affect health over time. While the articles analyzed in this paper are important to determine the path of future study, longitudinal studies are also necessary to investigate the temporal relationship and changes between the two variables. As a result, it is important to note that this review did not determine if the use of the HLS scale prompted more intense symptoms of rumination over historical loss which contributed to the significant association with poor mental health, or if historical loss does have a greater association with poor mental health. It is necessary to examine the moderating variable of rumination through future longitudinal studies to clearly define the association. Also, it is not clear if worsening health prompts more feelings of historical loss. Furthermore, the structure of convenience sampling also calls into question if the samples included are generalizable to the greater population. The level of trust participants had in the researchers and study may have affected the results found. It is very possible that the diversity of the Native American population is underrepresented in the studies analyzed in this paper.

While data on tribal affiliation was collected, there was not enough provided across studies to reach any significant conclusions. There were ten tribes listed, with little knowledge if any were overrepresented due to the majority of the studies withholding tribal affiliation from

publication due to anonymity concerns. Furthermore, more diversity in location and type of residence for further analyses. Location of residence has greatly shifted for the population; the majority of Native Americans now live off reservations in urban centers, with the largest population in California. Expanding research efforts to capture Native Americans across the nation, not solely reservations will be an important step in future research. It will be necessary in clarifying the degree of moderation these have on the variables in question.

Finally, this study only found three articles that examined the effects of historical loss on physical health. The Native American population has notably higher rates of diabetes, cardiovascular disease, and cancer when compared to other ethnic groups. However, definitive causes that explain this correlation have not been investigated. More research in this area would determine if there were truly no association between the two variables.

Clinical and Policy Implications

The findings support that historical trauma is an important consideration in the health of Native Americans. This topic has essential implications on the continued health and wellbeing on the people. Though more research will be needed to assess the validity of the HLS construct, those who work closely with the population can reflect on the results it has already shown. The work has already started and must be continued. Based off the results of this meta-analysis, future direction in health policy, education, and care can be proposed.

A large barrier to addressing Native American issues is an overall lack of understanding of the full history of the richness of the cultures, diversity of their peoples, and their lives before and after colonization. Native American culture did not stop with colonization, nor did it fail to thrive after. However, Native Americans are often viewed and portrayed as a part of history, not a functioning piece of the present. People do not believe that Native issues, like a crippled

healthcare system, are issues at all. There is no education that captures the degree to which Indigenous peoples have been affected by colonization. The deadly consequences of simply acknowledging the effects of colonization puts the group at a deliberate disadvantage when interacting with society. Measurable, intentional change cannot be made without action. It is imperative to switch the mindset of a nation before 8.75 million people go extinct. This work cannot solely be completed by the Native peoples it affects; that is an unnecessary burden that they already have to bear.

Furthermore, priority must be given to the development and promotion of mental health and substance use care and education in Native American communities. These results and current disparities call for trauma-informed training for all medical professionals interacting with the population to ensure proper care. While most Indian Health Services facilities provide mental health services, many are limited in scope. They are further limited by general barriers affecting mental health access, like payment and travel difficulties. The high rates of poor mental health and historical trauma emphasize the need for increased mental health access in Native American communities. It is essential to provide opportunities to Native tribes and Indian Health Services to expand their services through dedicated funding and increased personnel.

Current efforts that have been established to bring Native issues into the spotlight are not enough. The results of this meta-analysis reveal a desperate need to incorporate, at the bare minimum, cultural competency training for all medical professionals, and ideally, more Indigenous doctors and funding for Indian Health Services. Furthermore, partnerships with Native tribes and other institutions to implement culturally specific interventions, such as traditional ceremonies and activities incorporated into mainstream culture, would further educate about the scope of historical trauma and build trust between Native Americans and future

researchers. When tribes signed away their lands, resources, and peace in exchange for healthcare, the expectation was better outcomes, not the silencing of their people.

The path to establishing health equity requires change at the systemic level to make it a lasting impact. Frankly, extensive reparations are needed. While the most obvious ones would be efforts to better fund Indian Health Services, others could include transferring hospital management to tribes and allowing Native American adolescents to attend universities now built on their land for free, increasing the percentage of Native students pursuing higher education. Ultimately, truth and reconciliation are needed from the systems responsible for forcibly removing their ancestors from their lands.

Conclusion

In summary, this study provided evidence for the association between historical loss and health outcomes, using 14 studies and 35 effect sizes to do so. Research on this topic is fairly new, with few articles examining it. Future research should aim to confirm the validity of the HLS as a scale for historical trauma as well as focus on other aspects of health. Moreover, conscious efforts should be made to turn the results found into action. Such advances would greatly benefit future policy work and better care for Native Americans across the nation.

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HISTORICAL TRAUMA AND HEALTH OUTCOMES

Table 1*Study Characteristics and Effect Sizes*

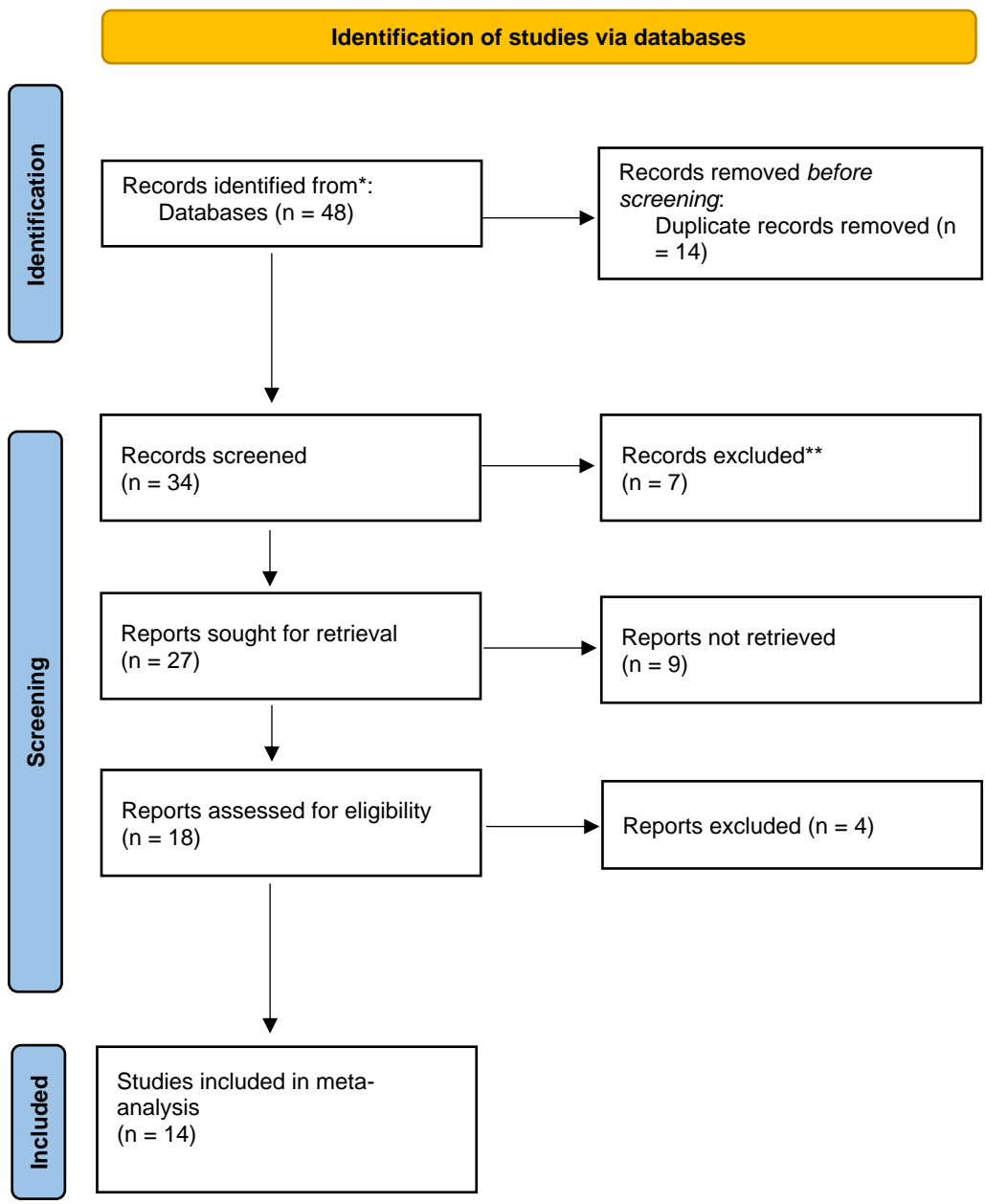
Article No.	Reference	Health component	Reservation residence majority	Historical loss measure	Health domain	N effect	Effect size (<i>r</i>)
1	Tucker et al. (2016a)	Depression	0	AHLS	MH	123	.19
2	Armenta et al. (2016) Wave 2	Anxiety	--	AHLS	MH	177	.24
	Armenta et al. (2016) Wave 3	Anxiety	--	AHLS	MH	422	.22
	Armenta et al. (2016) Wave 5	Anxiety	--	AHLS	MH	605	.23
	Armenta et al. (2016) Wave 7	Anxiety	--	AHLS	MH	569	.22
3	Ehlers et al. (2013)	General MH	1	HLS	MH	306	.10
	Ehlers et al. (2013)	General SU	1	HLS	SU	306	.14
4	Walls et al. (2016) Sample a	Self-esteem	1	AHLS	MH	569	-.04
	Walls et al. (2016) Sample a	Depression	1	AHLS	MH	569	.20
	Walls et al. (2016) Sample a	Anxiety	1	AHLS	MH	569	.22
	Walls et al. (2016) Sample a	Anger	1	AHLS	MH	569	.13
	Walls et al. (2016) Sample b	Positive affect	1	HLS	MH	563	-.03
	Walls et al. (2016) Sample b	Negative affect	1	HLS	MH	563	.17
	Walls et al. (2016) Sample b	Somatic complaints	1	HLS	PH	563	.23
	Walls et al. (2016) Sample b	Interpersonal difficulties	1	HLS	MH	563	.20
5	Gueco (2022)	General SU	--	HLS	SU	82	.06
6	Gameon & Skewes (2021)	PTSD	1	HLS	MH	192	.23
	Gameon & Skewes (2021)	PDA	1	HLS	SU	192	.13
	Gameon & Skewes (2021)	PHAUD	1	HLS	SU	192	-.15
	Gameon & Skewes (2021)	DDD	1	HLS	SU	192	-.11
	Gameon & Skewes (2021)	PDUD	1	HLS	SU	192	-.12
7	Clark & Winterowd (2012)	Binge Eating	0	HLS	PH	269	.30
8	John-Hunderson & Ginty (2020)	General MH	0	HLS	MH	205	.35
9	Anastario et al. (2013)	Sex with multiple partners	1	HLS	PH	120	.22

	Anastario et al. (2013)	Inconsistent condom use	1	HLS	PH	93	-.14
10	Tucker et al. (2016b)	Suicidality	--	AHLS	MH	140	.04
11	Soto et al. (2015)	Experimental smoking	0	HLS	SU	969	.17
	Soto et al. (2015)	Past month smoking	0	HLS	SU	969	.16
12	Wiechelt et al. (2012)	Past month alcohol use	0	HLS	SU	120	-.01
	Wiechelt et al. (2012)	Past month marijuana use	0	HLS	SU	120	.00
	Wiechelt et al. (2012)	Past month illicit drug use	0	HLS	SU	120	.00
	Wiechelt et al. (2012)	Lifetime marijuana use	0	HLS	SU	120	-.01
	Wiechelt et al. (2012)	Lifetime illicit drug use	0	HLS	SU	120	-.01
13	Whitbeck et al. (2009)	Depression	1	AHLS	MH	459	.26
14	Spence et al. (2014)	Frequent marijuana use	1	HLS	SU	340	.00

Note. Female majority was coded as yes (1) and no (0). Reservation residence majority was coded as yes (1) and no (0). HLS = Historical Loss Scale. AHLS = Adolescent Historical Loss Scale. MH = Mental health. PH = Physical health. SU = Substance use. PTSD = Post Traumatic Stress Disorder. PDA = Percent of days abstained from alcohol. PHAUD = Percent of heavy alcohol use days. DDD = Number of drinks per drinking day. PDUD = Percent of drug use days.

HISTORICAL TRAUMA AND HEALTH OUTCOMES

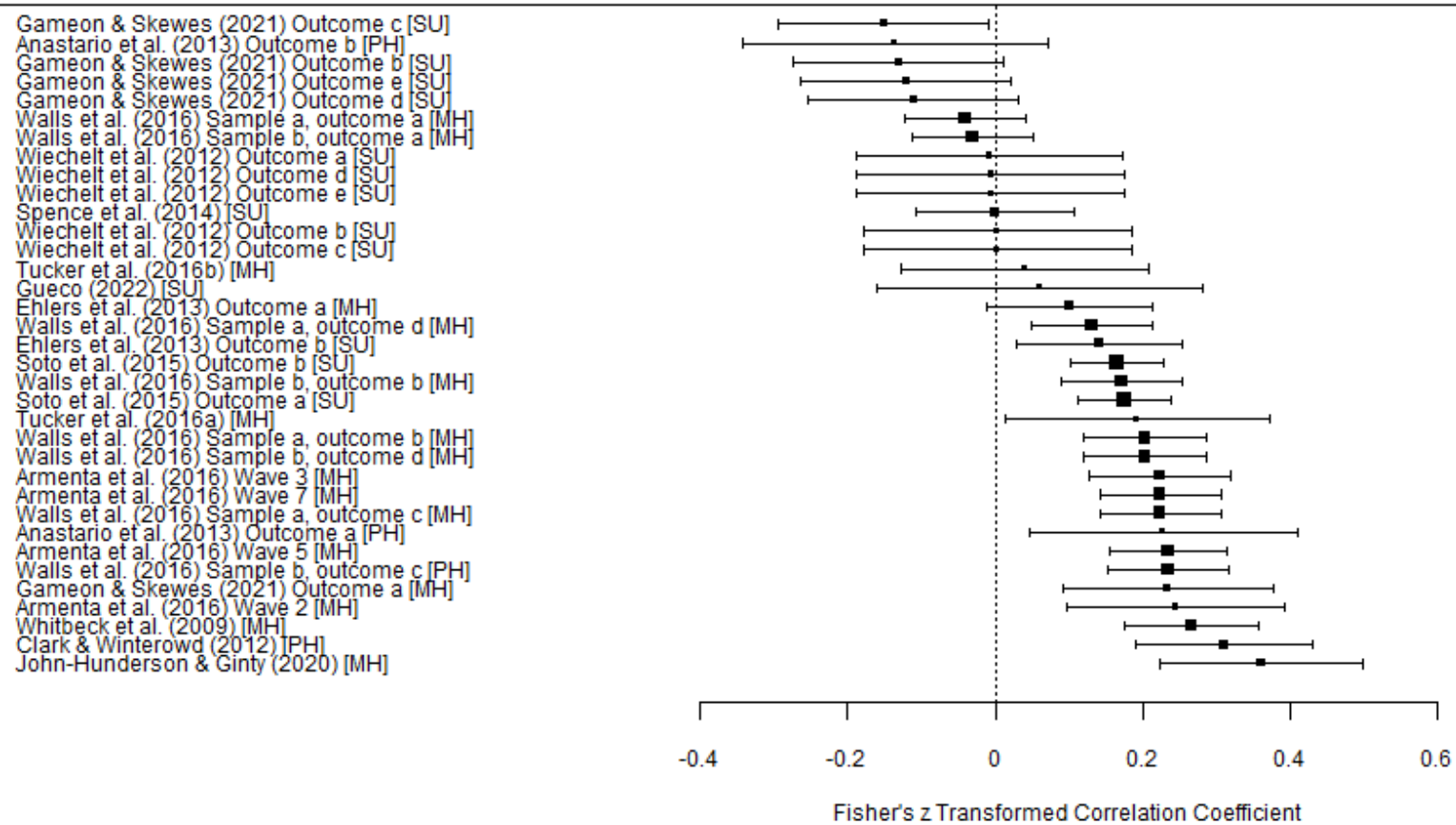
Figure 1.
Study Identification, Screening, and Inclusion Flow Chart



HISTORICAL TRAUMA AND HEALTH OUTCOMES

Figure 2.

Forest Plot of All Effect Size Estimates and Their 95% Confidence Intervals



HISTORICAL TRAUMA AND HEALTH OUTCOMES

Figure 3.

Forest Plot of Mental Health Effect Size Estimates and Their 95% Confidence Intervals

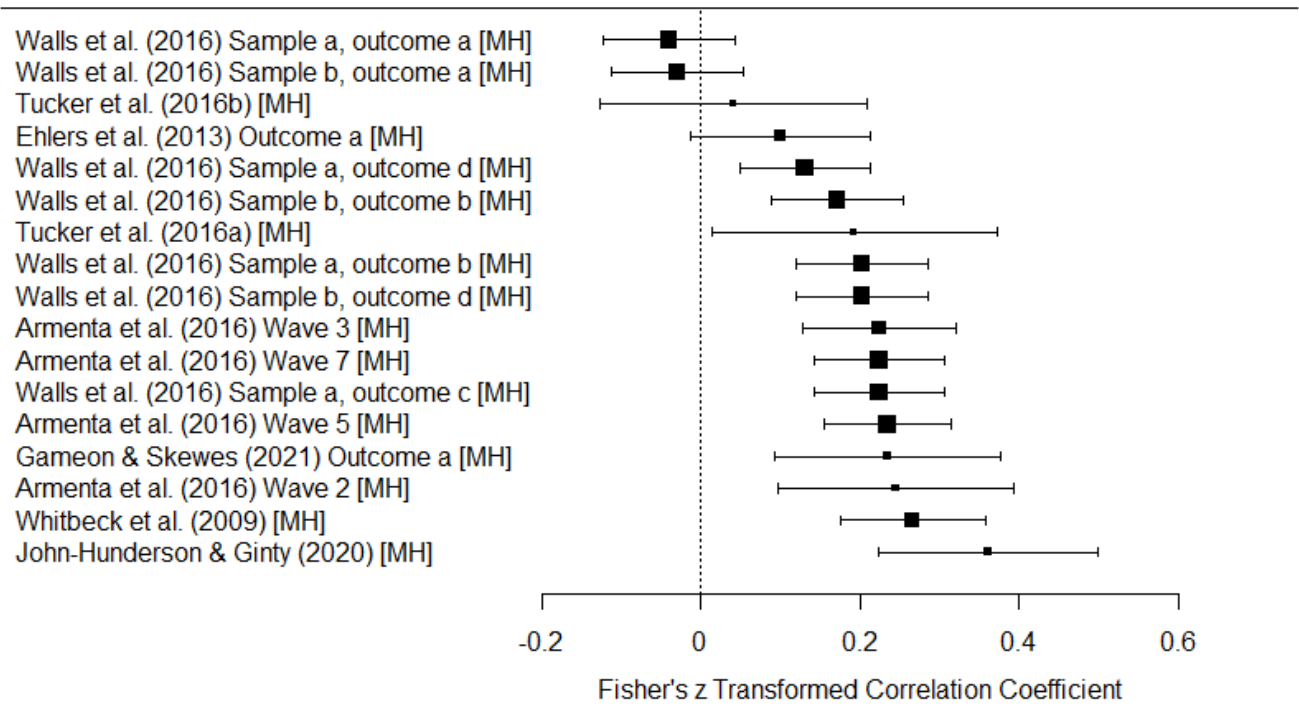


Figure 4.

Forest Plot of Physical Health Effect Size Estimates and Their 95% Confidence Intervals

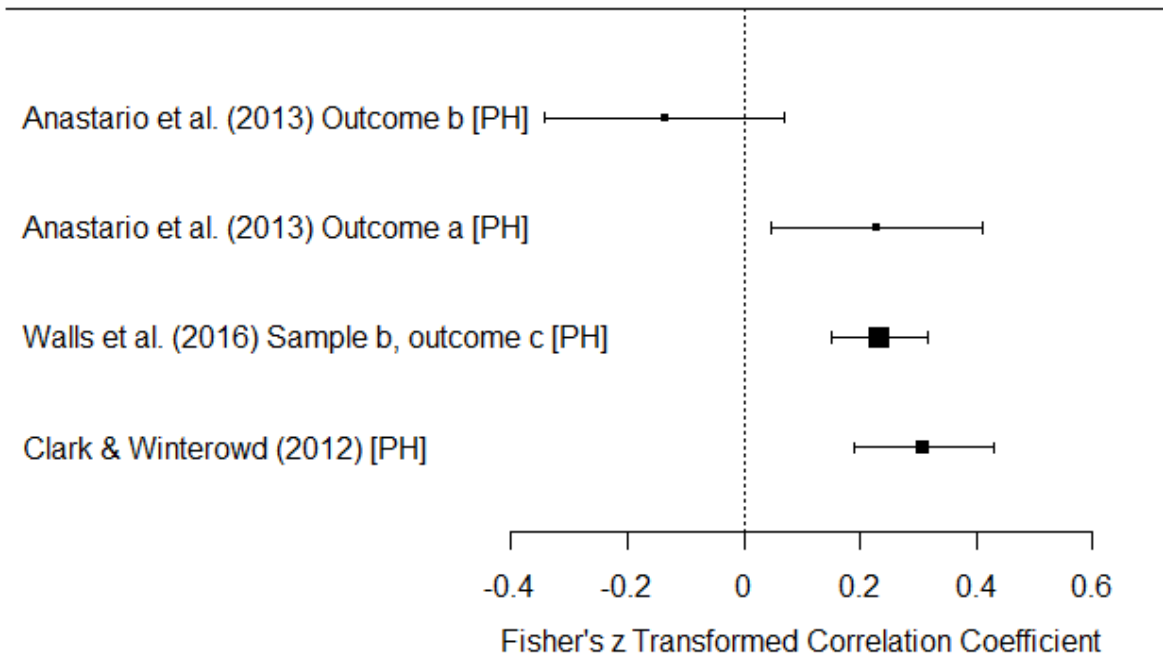


Figure 5.

Forest Plot of Substance Use Effect Size Estimates and Their 95% Confidence Intervals

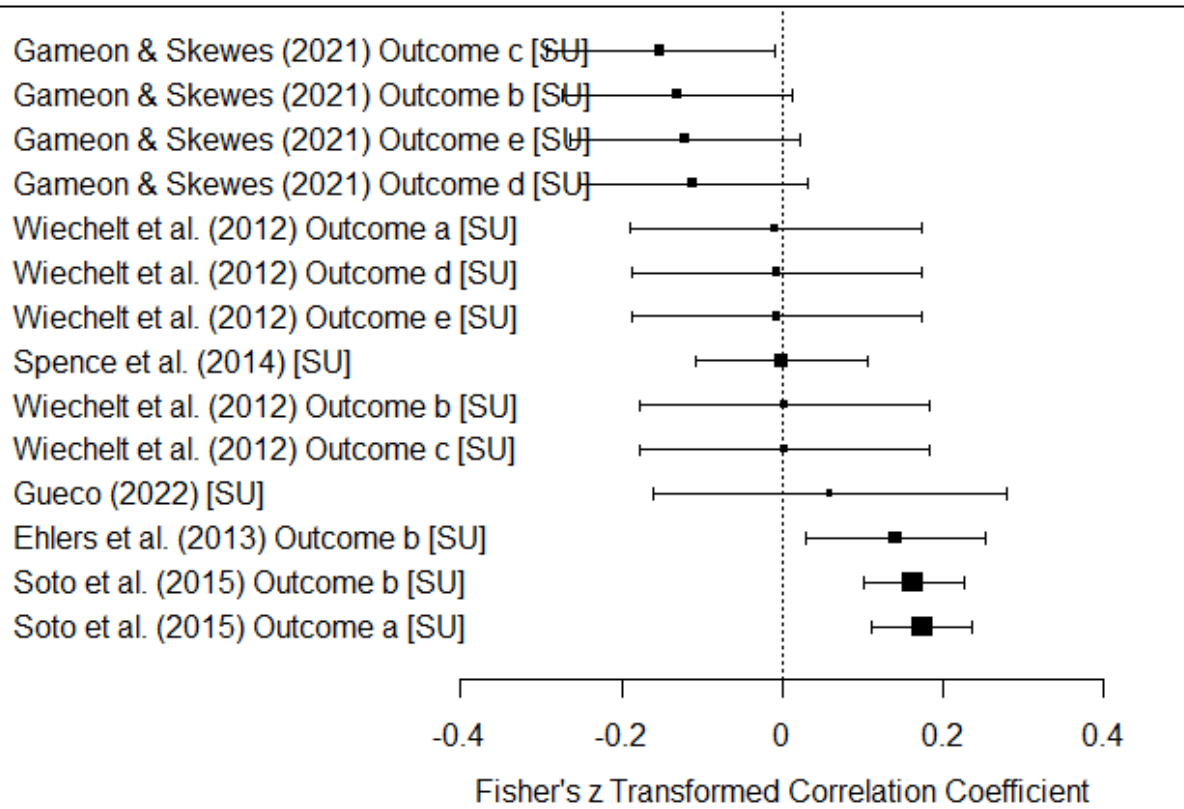


Figure 6.

Funnel Plot

