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Abstract

Mental Health First Aid has been developed to train the general public to give initial support to those in mental health crisis and development. The effectiveness of Mental Health First Aid has been questioned due to its relatively short history of the course. Mental Health First Aid was recently widely-disseminated in New York City as part of the ThriveNYC initiative. While most studies were supportive of the training, there has been no study that specifically examines New York residents. We recruited 328 New York residents who self-reported whether or not they have participated in Mental Health First Aid via Amazon Mechanical Tturk and measured their mental health literacy, stigmatizing attitudes, and beliefs about its recovery. Contrary to previous literature, hierarchical linear regression analysis revealed that Mental Health First Aid was associated with decreased mental health literacy, increased mental health stigma, and negative beliefs about its recovery. A higher level of mental health literacy was consistently associated with lower levels of all mental health stigma scales and positive beliefs about mental health treatment. Being White, single, and having current interactions with individuals with mental disorders were also associated with decreased stigma. Mental Health First Aid in New York may need to revise its training course to improve mental health literacy to deliver more appropriate initial mental health services. Further studies are needed to investigate additional associated factors of Mental Health First Aid.

Keywords: mental health first aid, mental health literacy, mental health stigma, race, marriage, mental health interaction

Impacts of Mental Health First Aid in New York on Mental Health Literacy and Stigma

Mental health (MH) knowledge of the general population has grown and many diagnostic tools related to mental illness have been developed. However, the level of MH knowledge seems to be insufficient as shown in widespread assumptions that people with schizophrenia are dangerous (Reavely & Jorm, 2012), or that many offenders escape from conviction by using the insanity defense, even though the actual number of cases is limited (Silver, Cirincione, & Steadman, 1994). People with MH problems face discrimination in the workplace, criminal justice settings, and the housing market (Corrigan et al., 2002,2003; Van Brakel, 2006). Previous studies have found that employers are hesitant to hire people with chronic schizophrenia as they believed people with this mental illness are dangerous and unpredictable (Reavley & Jorm, 2012; West, Hewstone, & Holmes, 2010). One major reason for such misconceptions is a low level of MH literacy which is defined as "knowledge and beliefs about mental disorders which aid their recognition, management or prevention" (Jorm et al., 1997).

There have been a few programs to increase the public's MH literacy. Mental Health First Aid (MHFA) was developed to assist people in providing initial support to symptomatic MH patients, developing comprehensive mental disorder management skills, and facilitating visits to specialized hospitals and medical experts (Kitchener & Jorm, 2008). This program also trains participants to become good listeners and not to discriminate against people showing mental illness. Originated in Australia, MHFA has been widely adopted in many countries such as Cambodia, Canada, China, Denmark, England, and Saudi Arabia. In the U.S., more than 1.5 million people have received the training since the Missouri Department of Mental Health brought the program in 2008. Recently, related studies have been published that support the effectiveness of MHFA. Hadlaczky et al. (2014) showed that MHFA increases their samples'

MH knowledge and supportive behavior, and decreases negative MH attitudes. Kelly et al. (2011), distributing the Personal Stigma scale and Perceived Stigma scale (Griffiths et al., 2004), a 21-item questionnaire about MH knowledge, and two vignettes of people with major depression and schizophrenia ($N = 246$), obtained favorable results that Youth MHFA improves the participants' MH knowledge and confidence of giving appropriate help to mentally ill adolescents. Kitchener and Jorm (2002) evaluated the program with 210 participants and detected positive changes in people's ability to recognize mental illness, beliefs about MH treatment, social distance decrement from MH patients, and attitudes towards them. With a larger sample size ($N = 5936$), the study conducted by Morgan, Ross, and Reavley (2018) supported the effectiveness of MHFA by utilizing Social Distance Scale (Link et al., 1999), Personal Stigma Scale (Griffiths et al., 2008), Attitudes to Mental Illness Scale (Luty et al., 2006), Opening Minds Scale for Healthcare Providers (Kassam et al., 2012), and Personal Attributes scale (Angermeyer & Matschinger, 2003). Similar to the current study design, O'Reilly, Bell, and Kelly's study (2011) collected pharmacy school students at the University of Sydney ($N = 272$) and found that MHFA completers were more likely to recognize mental disorders correctly, assist people with depression and schizophrenia more properly, be confident to give suitable pharmaceutical services, and less likely to feel the social distance, than MHFA non-completers. MHFA has been shown to be effective not only for Westerners but also for a Chinse community in Melbourne, Australia (Lam, Jorm, & Wong, 2010). The New York City Department of Health and Mental Hygiene (DOHMH) has implemented free MHFA courses for all New York residents as part of the Thrive NYC initiative.

Corrigan (2004) defines MH stigma as "the threats of diminished self-esteem and of public identification when labeled mentally ill." (p. 614) Besides forming social discrimination

against people with mental disorders, MH stigma also impedes the treatment operation for such disorders (Corrigan 2000; Link et al., 1989; Tsang et al., 2003). Studies have found that people with mental illness often do not report their mental conditions compared to those with other health conditions (Bharadwaj & Suziedelyte, 2017). Fear of stigma and loss of social opportunities made people with depression be reluctant to ask professional medical care (Corrigan, 2003). Those who receive MH care often conceal their MH status to avoid discriminatory behavior of others (Link et al., 1989; Van Brakel, 2006; Wahl, 1999). Military members also have similar hesitation even when they are experiencing psychiatric issues (Acosta et al., 2014). Yanos, Roe, and Lysaker (2010) highlighted that assuming oneself as incompetent and inadequate due to one's self-identity as mentally disordered aggravates suicidal risk, social interaction, performance in workplaces, and MH symptoms.

The relationship between MH literacy and stigma has not been clearly verified by previous research. However, it is plausible that one who lacks MH literacy is more likely to self-stigmatize because this literacy is defined as "knowledge and beliefs about mental disorders which aid their recognition, management or prevention" (Jorm et al.,1997, p. 182). According to previous literature, MH literacy plays critical roles in recognizing MH condition, seeking professional assistance, and managing symptoms of mental disorders (Andrews et al., 1999; Jorm et al., 1997; Jorm 2000; Kelly, Jorm, & Wright 2007; Smith & Shochett, 2011). Similar to how stigma obstructs MH patients from seeking medical help and conceal their MH condition (Corrigan 2003; Link et al., 1989; Van Brakel, 2006; Wahl, 1999), low levels of MH literacy also impede appropriate mental care service utilization. People with mental disorders in many disorders, such as anxiety and mood disorders, do not look for treatment when they suffer these symptoms (Wang et al., 2007a). For instance, people in the United States are hesitant to seek

medical service although mental illness is not unusual (Jorm, 2012). Research by Andrew et al. (1999) illustrates that more than a half of population who is categorized as mentally ill patients quit visiting doctor's office or consultations. Furthermore, there are misbeliefs that taking anti-psychiatric pills is not practical (Dahlberg et al., 2008; Riedel-Heller, Matschinger, & Angermeyer, 2005) and that social phobia is not a mental disorder (Reavely & Jorm, 2012). As illustrated earlier, similar phenomena are shown in people with low level of MH stigma and literacy, which highlight the importance of supporting at-risk people in many countries and preventing people from stigmatizing. In other words, it seems to be plausible to study the relationship between MH literacy and stigma regarding the cause of much inaccurate information about people with mental illness which stigmatize them as violent.

Mental Health Literacy

Researchers typically assess an individual's MH literacy by using the vignette which asks the participant to interpret a scenario that describes a symptom of either depression or schizophrenia. Results from existing literature utilizing this method show that many people do not show high levels of recognizing mental disorders or distinguishing different types of psychological illnesses (Jorm et al., 1997; Jorm et al., 2000; Wang et al., 2007a; Wang et al., 2007b). For instance, only 39% and 27% participants of a study in Australia were able to correctly label symptoms of depression and schizophrenia, respectively, from vignettes of individuals with these conditions (Jorm et al., 1997). In a study conducted in Sweden, people who were mentally healthy *(n = 128)*, mentally ill with mental health service contact *(n = 125)*, and without the contact *(n = 105)* showed poor skills on interpreting the vignettes regardless of their MH background and mostly disagreed to meet counselors and take antidepressants (Dahlberg, Waern, & Runeson, 2008). A thematic analysis on 22 published studies revealed that

younger generations had a low level of MH literacy, believing self-reliance is the most preferred

MH management (Gulliver, Griffiths, & Christensen, 2010). A population-based health survey

(N= 1,678) showed that only 275 respondents had a normal level of MH literacy and were

willing to seek professional MH service and 392 respondents correctly interpreted a depression

vignette (Lam, 2014). In addition, even those who were diagnosed as moderate to severe

depression (*n* = 248) had a low level of MH literacy (Lam, 2014).

In order to better understand MH literacy, researchers have explored associated factors,

such as age, gender, and educational achievement. In the study Farrer et al. (2008), Australian

adults in different age groups were asked multiple questions associated with MH knowledge,

beliefs in medical treatment, and causes of mental illness. Older adults (70 years old or more)

showed poorer identifying skills and were more likely to believe that personal weakness causes

schizophrenia than young adults (18-24 years old) do (Farrer et al., 2008). Among Southeast

Asians *(N* = 3,006) whose MH literacy were assessed through methods such as vignettes

pertaining to various mental disorders, such as alcohol abuse, depression, and obsessive

compulsive disorder (OCD), being younger and highly educated were significant factors of better

interpretation of vignettes (Chong et al., 2016). Among young Australians *(N* = 1,207) between

the ages of 12 and 25, females were more aware of mental illnesses and had better MH

management skills than males (Cotton et al., 2006). A gender difference was also found in

Japanese respondents *(N* = 8,163) showing that males had poorer recognition of depression and

stronger inclination of suicide acceptance (Kaneko & Motohashi. 2007). Through a face-to-face

interview in a cross-sectional study *(N* = 2,052), Yu et al., (2016) found that the education level

was a significant factor in identifying and recognizing alcohol abuse, depression, and anxiety

vignettes. In other studies, educational attainment was also shown to be a significant factor

because people with higher educational background interpret vignettes more correctly than those who received less education (Chong et al., 2016; Reavley & Jorm, 2012; Yu et al., 2016).

Although vignette interview, which is one of the most popular measurement methods, has successfully evaluated the public's MH literacy level, a methodological limitation exists because a qualitative assessment may be vulnerable to committing rater error compared to a quantitative approach (O'Connor et al., 2014). To overcome the limitations of previous qualitative methods, O'Connor and Casey (2015) developed the Mental Health Literacy Scale (MHLS) to measure the level of MH literacy which has a strong methodological power with good internal and test-retest reliability. In addition, the score-based system of MHLS allows for reduced measurement time and provides a convenient self-report system (O'Connor & Casey, 2015).

Mental Health Stigma

Corrigan et al., (2003) revealed that half of his total participants with severe mental illness *(N = 1,824)* in his study reported that they had experienced discrimination due to their mental disability. MH stigma is an essential factor in understanding people with mental illness and facilitating their MH service utilization as it affects the support system and community resources (Corrigan, Druss, & Perlick, 2014). A nationwide survey with mental health service consumers (*n = 1,301*) and follow-up interviews (*n = 100*) found that the patients were afraid of revealing their illness to others due to the fear of being stigmatized and treated unfavorably (Wahl, 1999). A systemic review of 27 studies suggested adverse economic impacts of mental illness stigma on employment, income, and investment on healthcare welfares (Sharac et al., 2010). Yanos et al., (2008) investigated 102 persons with schizophrenia spectrum disorders and found that internalized mental disorder stigma which obstructs social interaction is associated with negative outcome of MH recovery. Fung, Tsang, and Corrigan (2008) also found that

internalized stigma disturbs MH treatment adherence. Consistently, the negative relationship between internalized MH stigma and self-esteem has shown in previous literature (Lysaker et al., 2008; Werner, Aviv, & Barak, 2008).

In order to analyze the characteristics of stigma, associated factors on people with a MH condition have been studied. In a study about stigma, lack of MH knowledge, ignorance of mental illness management, and prejudice of MH patients, were significant barriers of seeking mental illness treatment (Henderson, Evans-Lacko, & Thornicroft, 2013). Among a sample suffering from mental illness, those who have a lower education level (Alonso et al., 2009; Corrigan, 2003; Van Brakel, 2006; Wahl, 1999) and those who are not employed were more vulnerable to be labeled (Alonso et al., 2009; Angermeyer, 2003; Corrigan, 2003; Van Brakel, 2006; Wahl, 1999). In a cross-sectional survey with European samples ($N = 8796$) using two stigma measurement scales (embarrassment and discrimination), people who are married, unemployed, and less educated were susceptible to be stigmatized (Alonso et al., 2009). Eisenberg et al. (2009) studied about the general public's beliefs about mental illness (perceived public stigma) and one's attitude towards mental disorders (personal stigma) with randomly selected students from 13 universities ($N = 5,555$). This study found associated factors of mental illness stigma that (1) perceived public mental illness stigma is stronger than personal stigma (2) being male, Asian, younger, more religious, international, and those who are from lower socioeconomic family members are vulnerable to having personal stigma, and (3) personal stigma was a barrier of seeking medical help, while perceived public stigma was not associated with help seeking (Eisenberg et al., 2009). In addition to perceived stigma, women with schizophrenia are also exposed to sexual violence and vulnerable to suffering a repetitive trauma (Darves-Bornoz et al., 1995). However, not all studies fully agree that stigma is a significant

component of MH problems. Mak et al., (2007) conducted a meta-analysis with 49 empirical studies but the relationship between stigma and mental illness was not significant.

Although MHFA is offered in over 25 countries with supportive literature, the effectiveness of this program in New York has not been studied well. The aims of this study are to find: (1) the relationship between MH literacy and stigma, (2) the effectiveness of Mental Health First Aid program completion on MH literacy and stigma, (3), the factors associated with MH literacy and stigma, (4) recommendations for improving Mental Health First Aid as an intervention to decrease stigma in New York. This study hypothesizes that a higher level of MH is associated with lower level of MH stigma. That is, people with mental disorders are less likely to be labeled as unpredictable and inappropriate when others have the correct information about people with mental illness. The MHFA successfully instructs program participants to have a higher level of MH literacy and anti-stigmatizing attitudes toward people with MH programs and their various mental disorders. Younger generations, female, Whites, highly educated, and those who have interactions with MH patients are more resilient to possess stigmatizing attitudes, compared to those who are in older generations, male, racial minorities, less educated, and lack contacts with MH patients.

Method

Research design

A cross-sectional design was used, comparing New York State residents who self-reported completing MHFA to New York State residents who did not self-report completing MHFA on a range of mental health literacy and mental health stigma measures.

Participants

Participants were 328 New York State residents (156 who self-reported completing

MHFA program and 172 general community members). The demographic characteristics of the

sample are described in Table 1. The number of male participants was slightly higher than

females, and the majority was White. The mean age of the sample was 33.6 (SD=9.8). Slightly

more than half of the sample had a bachelor's degree and was single. In particular, 33.3% were

18-29 years old, 28.5% were 30-49 years old, and 38.1% were 50 years old or older. Nearly one-

third of the sample is currently living with or working with someone with mental illness, and

one-fourth has someone with mental illness as a neighbor. More than half reported having a close

friend with a mental illness. To note, analysis of variance (ANOVA) found statistical

significances in race and marital status, meaning that White and single participants were less

likely to receive MHFA.

Procedure

All participants were collected through Amazon Mechanical Turk (MTurk) with targeted

recruitment of New York State residents through Amazon MTurk's system qualification for

location. Recruited participants were redirected to Qualtrics which is the online survey platform

and asked to answer the survey consists of 8 scales were distributed to identify their levels of

mental health literacy, stigma, and attitudes toward mental health problems, such as major

depressive and anxiety disorders. Each participant was given $3 Amazon eGiftcard as an

appreciation for survey participation. Recruiting, answering survey, and compensating were

implemented electronically.

Measures

Mental Health Literacy Scale (MHLS; O'Connor and Casey, 2015). The MHLS is a scale-

based mental health literacy measurement instrument. The MHLS contains 35-item based on

iterative procedure, feedback from the professionals in clinical field, piloting testing, and

psychometric quality check, with good internal and external validity. The MHLS consists of 35-item questionnaire asking mental disorder recognition ability (e.g., If someone experienced a low mood for two or more weeks, had a loss of pleasure or interest in their normal activities and experienced changes in their appetite and sleep then to what extent do you think it is likely they have Major Depressive Disorder); mental health information accessibility, general mental health knowledge, self-care knowledge, professional assistant availability (e.g., I am confident I have access to resources (e.g., GP, internet, friends) that I can use to seek information about mental illness); and mental health attitude (e.g., How willing would you be to move next door to someone with a mental illness?). Among 35-item, fifteen items have 4-point scale, ranging from 1 = *very unlikely/unhelpful* to 4 = *very likely/helpful* and the rest of twenty items have 5-point scale, ranging from 1 = *very unlikely/definitely unwilling* to 5 = *strongly agree/definitely willing*. The internal consistency for MHLS in the current study was good ($a = .90$).

Self-Stigma of Seeking Help (SSOSH; Vogel, Wade, & Haake, 2006). The goals of developing SSOSH are measuring the perception that seeking professional assistant or medical service would negatively affect one's self-appreciation and self-recognition. The SSOSH is a scale-based measurement tool containing 10-item based on 5-point scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree* ($a = .91$). Each item is designed to identify if reluctance to receiving professional help is associated with avoiding self-stigma, for example, "I would feel inadequate if I went to a therapist for psychological help" and "Seeking psychological help would make me feel less intelligent." The internal consistency for SSOSH was acceptable in the present study ($a = .73$)

The Reported and Intended Behaviour Scale (RIBS; Evans-Lacko et al., 2011). The RIBS a quantitative evaluation tool that measures stigmatizing attitudes toward people suffering mental

health problems. The RIBS contains 8-item and two separate scoring systems; 1-4 item has "yes." "no,", or "don't know" (e.g., Are you currently living with or have you ever lived with, someone with a mental health problem?"); 5-8 item has 5-point scoring format, ranging from 1 = *agree strongly* to 5 = *disagree strongly*, or "don't know" (e.g., In the future, I would be willing to live with someone with a mental health problem). More specifically, 1-4 item and 5-8 item ask previous or current behaviors and future intended behaviors, respectively. The RIBS has moderate to good overall internal consistency ($a = 0.85$) and test-retest reliability ($a = 0.75$) (Evans-Lacko et al., 2011). Due to the error with the survey format, the present study used only items one to four as part of the demographic characteristics to investigate whether the participants have had contact with mentally ill individuals. The internal consistency for RIBS was acceptable in the present study ($a = 0.72$).

Mental Illness Microagressions Scale – Perpetrator Version (MIMS-P; Gonzales et al., 2015). The MIMS-P is invented to measure a subtle sign of mental health stigma. The MIMS-P with 14-item ($a = .89$) is constituted with three subscales, which are Assumption of Inability (5-item, $a = .82$), Patronization (5-item, $a = .82$), and Fear of Mental Illness (4-item, $a = .74$). Each subscale contains, for example, "If someone I'm close to told me that they had a mental illness diagnosis, I would expect them to have trouble understanding some things" (Assumption of Inability), "If someone I'm close to told me that they had a mental illness diagnosis, I would tell them they should go to the hospital, even if they told me they were fine" (Patronization), and "If I found out that someone I know at work or school had a mental illness diagnosis, I would avoid becoming friends with them" (Fear). Respondents are asked to answer all items using 4-point Likert scale, ranging from *strongly disagree* to *strongly agree.* The internal consistency for MIMS-P in the current study was found to be strong ($a = .91$).

The Generalised Anxiety Stigma Scale (GASS; Griffiths et al., 2011).

The GASS is one of the promising stigma measurement instruments for examining the

perception of generalized anxiety disorder (Griffiths et al., 2011). The GASS consists of 20-item

based on two separate parts: The first 10 items analyze the personal attitudes toward anxiety

(GASS-Personal Items, $a = .86$), while the second 10 items evaluate the perception of the

attitudes toward anxiety of others (GASS-Received Items, $a = .91$) (Griffiths et al., 2011). The

GASS-Personal Items, for example, includes "An anxiety disorder is not a real medical illness,"

and the GASS-Received Items includes "Most people think that an anxiety disorder is not a real

medical illness." All items have 5-point score format, ranging from $0 = $ *strongly disagree* to $4 = $

strongly agree. The internal consistencies for GASS were strong (GASS-Personal Items, $a = .95$)

(GASS-Received Items, $a = .91$).

Depression Social Distance (DSD; Link, Phelan, Bresnahan, Stueve, & Perscosolido, 1999).

The DSD contains vignettes of "John" who is showing major depressive disorder symptoms. The

DSD measures the attitudes towards John by asking, for examples, if the respondents are willing

to live as a neighbor, spend an evening with, to be friends with, work with, and to be familiar

members with John ($a = .90$). Similar to the previously found the internal consistency level, the

present study had good internal consistency ($a = .88$).

The Attitudes about Mental Illness and its Treatment Scale (AMIS; Kobau et al., 2010). The

AMIS is developed to monitor the attitudes toward mental health problems of the U.S.

populations by Substance Abuse and Mental Health Services Administration (SAMHSA) and

Centers for Disease Control and Prevention (CDC) (Kobau et al., 2010). Two subscales

(Negative Stereotypes, $a = .69$) and (Recovery and Outcomes $a = .66$) constitute the AMIS. For

example, 7-item contains "I believe a person with mental illness is a danger to others" and "I

believe a person with mental illness is unpredictable." Each item is scored using a Likert scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Positive statements, such as "I believe a person with mental illness can eventually recover" and "Treatment can help people with mental illness lead normal lives" are reversely scored. In the present study, the internal consistencies for AMIS was acceptable (Negative Stereotypes, $a = .78$) (Recovery and Outcomes $a = .68$).

The Attribution Questionnaire (AQ-9; Corrigan, Watson, Warpinski, & Gracia, 2004). The AQ-9 contains nine questionnaires that ask attribution and attitude toward a vignette character. For instance, the AQ-9 describes Harry as a man showing symptoms of schizophrenia ($a = .81$) and asks if "Harry is to blame for his illness". The scoring system has 9-point scale, ranging from *not al all* to *very much*. Similar to what had been proven, the internal consistency for AQ-9 in the current research was good ($a = .80$).

Analysis Plan

We ran three separate statistical ways which are t-test (MHFA group and random group) for demographic characteristics, correlational analysis, and hierarchical linear regression analysis for examining the association between MHFA and the MH stigma scales. Reported and Intended Behavior Scale (RIBS) was excluded from the stigma-related scales due to a collection error. Instead, RIBS was used as a demographic factor because it asks if the participants have contact with MH patients. The average survey completion time was approximately 15 minutes and twelve participants whose completion time was less than 5 minutes were excluded from the study sample. All analysis was conducted via SPSS v.25.

Results

Correlation Analysis

Table 2 reports correlation analysis between demographic factors and mental health

background and stigma-related variables (see Table 2). To note, MHFA was coded as 1 = completed and 2 = non-completed, MH literacy was reported as 1 = lower literacy and 5 = higher literacy, race was coded as 1 = other than White and 2 = White, gender was coded as 1 = male and 2 = female, marital status was coded as 1 = married or partnered and 2 = single, and Reported and Intended Behavior Scale (RIBS) was coded as 1 = contact and 2 = non-contact. Higher scores on stigma scales mean a higher level of stigma. In the case of demographic and mental health background correlation, race was correlated with MHFA ($r = .17$, $n = 326$, $p < .01$), MH literacy level ($r = .23$, $n = 326$, $p < .01$), and having contact with MH patients ($r = -.14$, $n = 317$, $p < .05$). Gender was negatively associated with having contact with MH patients ($r = -.17$, $n = 314$, $p < .01$). Marital status had a significant positive correlation with MHFA ($r = .22$, $n = 328$, $p < .01$) and MH literacy level ($r = .26$, $n = 328$, $p < .01$).

In the case of correlation between demographic factors and stigma-related factors, education was correlated with engagement in microaggression with MH patients ($r = .15$, $n = 323$, $p < .01$), attitude towards schizophrenia ($r = .17$, $n = 323$, $p < .01$), attitude towards individuals with anxiety ($r = .13$, $n = 323$, $p < .05$), stereotype of mental illness ($r = .19$, $n = 323$, $p < .01$), and attitude towards MH recovery through medical treatment and support ($r = .14$, $n = 323$, $p < .05$). Race was correlated with engagement in microaggression behavior ($r = -.15$, $n = 321$, $p < .01$), feeling of social distance from individuals with depression ($r = -.17$, $n = 321$, $p < .01$), stigmatizing attitude towards individuals with anxiety ($r = -.18$, $n = 321$, $p < .01$), and having attitude towards mental illness ($r = -.18$, $n = 321$, $p < .01$). Gender was negatively correlated with engagement in microaggression ($r = -.05$, $n = 323$, $p < .05$) and feeling of social distance from people with depression ($r = -.11$, $n = 323$, $p < .05$). Marriage was significantly associated with help-seeking self-stigma ($r = -.16$, $n = 323$, $p < .01$), engagement in

microaggression with MH patients ($r = -.23$, $n = 323$, $p < .01$), feeling of social distance from

people with depression ($r = -.11$, $n = 323$, $p < .05$), attribution bias in schizophrenia ($r = -.23$, $n =$

323, $p < .01$), stigmatizing attitude towards people with anxiety disorder ($r = -.35$, $n = 323$, $p <$

01) and belief about the general public's stigmatizing attitudes towards anxiety ($r = -.12$, $n =$

323, $p < .05$), and negative stereotype of mental illness ($r = -.12$, $n = 323$, $p < .05$).

Mental health background variables were strongly correlated with one another. MH

literacy had a significant correlation with MHFA ($r = .24$, $n = 328$, $p < .01$) and interaction with

MH patients ($r = -.32$, $n = 319$, $p < .01$). Mental health background variables were strongly

correlated with stigma-related variables. MHFA completion was associated with higher help-

seeking self-stigma ($r = -.14$, $n = 323$, $p < .05$), higher amount of microaggression ($r = -.36$, $n =$

323, $p < .01$), negative belief about schizophrenia and attribution of schizophrenia to one's fault

($r = -.36$, $n = 323$, $p < .01$), stigmatizing thought about anxiety ($r = -.37$, $n = 323$, $p < .01$), belief

about the general public have stigmatizing attitude towards anxiety disorder ($r = -.17$, $n = 323$, p

$< .01$), negative stereotype of mental illness ($r = -.13$, $n = 323$, $p < .05$), and negative belief about

mental disorder recovery ($r = .15$, $n = 323$, $p < .01$). Higher MH literacy significantly correlated

with all currently utilized stigma scales, as seen in the relationships with self-stigma of seeking-

help ($r = -.55$, $n = 323$, $p < .01$), engagement in microaggression ($r = -.65$, $n = 323$, $p < .01$),

feeling of distance from people with depression ($r = .50$, $n = 323$, $p < .01$), attribution bias in

schizophrenia ($r = -.56$, $n = 323$, $p < .01$), anxiety personal stigma ($r = -.79$, $n = 323$, $p < .01$),

anxiety perceived stigma ($r = -.18$, $n = 323$, $p < .01$), negative stereotype of metal health patients

($r = -.61$, $n = 323$, $p < .01$), and negative belief about MH recovery and outcome ($r = .46$, $n =$

323, $p < .01$). Having current interaction with MH patients was correlated with self-stigma

seeking-help ($r = .12$, $n = 319$, $p < .05$), engagement in microaggression ($r = .16$, $n = 319$, p

< .01), feeling of social distance from people with depression ($r = .27$, $n = 319$, $p < .01$),

attribution bias in schizophrenia ($r = .15$, $n = 319$, $p < .01$), anxiety personal stigma ($r = .16$, $n = 319$, $p < .01$), and negative stereotype of mental illness ($r = .19$, $n = 319$, $p < .01$). However,

people who reported they contact with mentally ill friends, family members, or co-workers

tended to believe that the general public has stigmatizing attitude towards people with anxiety

disorder ($r = -.12$, $n = 319$, $p < .05$).

Hierarchical Regression Analysis

Table 3 reports hierarchical linear regression analysis investigating whether MHFA

would significantly predict increased MH literacy and decreased MH stigma, including self-

stigma of seeking-help, engagement in microaggression, feeling of social distance from people

with depression, attribution bias in schizophrenia, anxiety personal stigma, anxiety perceived

stigma, and attitude about mental illness and its recovery outcome, controlling for age,

education, race, gender, marital status, and contact with MH patients (see Table 3). MHFA was

significantly associated with all scales except for negative stereotype of mental illness when

controlling for these predictors. The inclusion of MHFA in hierarchical linear regression analysis

increased $r2$ explained by approximately 5%. However, the direction of the relationship between

MHFA and the stigma scales was opposite to what was hypothesized. That is, participating in

MHFA was associated with lower scores on measures of mental health literacy and higher scores

on most aspects of stigma. Among demographic factors, consistent with prior research, White

race ethnicity predicted higher MH literacy, lower attribution to schizophrenia, and anxiety

personal stigma. Marriage predicted a lower level of MH literacy, a higher level of self-stigma of

seeking-help, engagement in microaggression, attribution bias in schizophrenia, and belief about

MH recovery. Current contact with people with mental illness predicted lower amounts of microaggresion, anxiety personal stigma, and attitudes about MH recovery.

Discussion

The results of the current study do not replicate findings from previous literature regarding the effectiveness of MHFA in improving MH literacy and reducing MH stigma (Hadlaczky et al., 2014; Kelly et al., 2010; Kitchener & Jorm, 2002; Lam, Jorm, & Wong, 2010; Morgan, Ross, & Reavely, 2018; O'Reilly, Bell, & Kelly, 2011). Instead, the results show that not participating MHFA was associated with higher MH literacy. This finding is, to our knowledge, the first study that does not support the importance of MHFA in increasing MH literacy. It is plausibly important to note that MHFA completion has an inverse relationship with MH literacy level.

The current study outcomes also dispute existing literature that MHFA plays a positive role in reducing MH stigma. According to the results of the present study, people who completed MHFA tend to stigmatize themselves when they seek professional help or face MH problems, have a higher amount of microaggression to MH patients, have misbeliefs and stigmatizing attitude towards schizophrenia and anxiety disorder, and have skeptical thoughts about MH treatment and its recovery outcome, even after controlling demographic variables. However, MHFA completers and non-completers did not show significant differences in feeling a social distance from someone with depression and in having a negative stereotype of mentally ill people. For example, participants in both groups did not have significantly different attitudes when they were asked to move next to or work with a person with depression. Completion of MHFA also did not have a significant effect on beliefs that a person with mental illness is dangerous, unpredictable, or hard to talk with. One plausible explanation for these results is that

the completers believe that MH patients need medically professional assistance, not a superficial help based on a merely good intention. One goal of MHFA course is to correct commonly wrong MH helping skills. For example, MHFA instructors teach that saying "I know how you feel" is inappropriate and not useful when treating MH patients. Instead, it instructs how to let symptomatic patients receive sufficient help from medical experts. This may negatively influence stigma since people may come to believe that mentally disabled individuals must be treated by MH experts, not by laypersons. However, the negative relationship and its associated factors between MHFA and MH stigma needs to be further researched as it lacks supportive scientific literature.

Among demographic variables in the current study, being White, single, and having current contact with MH patients were less likely to have stigmatizing attitudes towards individuals with mental disorders. The racial disparity in stigma corresponds with findings from prior studies that people in racial minority group have a more stigmatizing attitude (Cooper-Patric et al., 1997; Silva de Crane & Spielberger, 1981; Sanders Thompson, Bazile, & Akbar, 2004; Whaley 1997; Deidre, Bruce, Link, & Phelan, 2006). However, the findings of the present study regarding marriage as a significant factor may need additional investigation. Reta et al., (2016) found that not unmarried people have lower social restrictiveness stigma towards mentally ill patients, in comparison to married people, believing that people with mental disorders should be isolated. The study of Lee et al. (2020) also found that married people are more likely to have more positive MH attitudes. On the other hand, Alonso et al., (2009) found that married individuals tend to have more stigmatizing attitudes which corresponds to the findings from the current study. More diverse studies about the correlation between marriage and MH stigma are required because men and women have different MH issues, even when they are

both married (Horwitz, White, & Howell-White, 1996) and single mothers who have different

characteristics of mental illness (Crosier, Butterworth, & Rodgers, 2007; Jayakody & Stauffer,

2000) are not fully represented in most existing studies.

      The current study shows that people who currently have contact with those who are

diagnosed with mental disorders as friends, co-workers, or family members were more likely to

have positive attitudes. Likewise, previous studies also found that social support mediates MH

stigma. Lindsey, Joe, and Nebbitt (2010) found that family social support had the essential role

in reducing stigma and Moses (2010) highlighted that counteracting efforts to reduce

stigmatization of adolescents by family members, peers, and school faculty are important.

Similarly, Birtel, Wood, and Kempa (2017) emphasized the role of social support utilization in

reducing stigma stems from substance abuse. Poor social support is linked to poor life quality of

persons with severe mental disorders, while supportive social interaction are associated with a

better life quality of them (Yanos, Rosenfield, & Horwitz, 2001). Although the current study did

not provide specific types and levels of social support, the findings from the current study may

reveal that simply having contact with MH patients have positive impacts. Thus, this may

suggest that an opportunity to be blended in a mentally healthy environment is important even

before receiving social support from others.

      Except for MHFA, MH literacy was significantly associated with all MH-related stigma.

The study participants who have a higher level of MH literacy tend to be resistant to MH stigma

and have a supportive viewpoint of mental illness recovery. Lee et al., (2020) also found that

higher MH literacy level is strongly linked to positive MH attitude, regardless of other

demographic factors. Similarly, MH knowledge was important for Hispanic patients to develop

non-stigmatizing attitudes toward people with depression (Lopez et al., 2018). Chen et al. (2014)

suggest that the intervention for raising MH literacy is needed to reduce stigmatizing and normalization of suicide. The present study results also showed that MH literacy was associated with inverse relationships with all MH stigma with all *p* values less than .01.

Unintended consequences of stigma interventions have been discussed at length by Corrigan (2018). For example, some interventions that seek to decrease stigma through education on the biomedical origins of some mental illnesses may inadvertently increase stigma, due to the tendency for the general public to see biomedical causes as unchangeable. MHFA may in some cases have adverse effects, contrary to prior positive reviews of its effectiveness on MH literacy and stigma. The negative outcomes are also in contrast with generally positive comments on MHFA of those who completed it (see Appendix A). It may suggest that the New York government and NYC Thrive that supervise MHFA may need to refer the current study findings to deliver better intervention. According to the current study, MHFA training is recommended to highlight the role of MH literacy and target racial minority groups, married people, and those who lack interaction with mentally ill patients. Moreover, Thornicroft et al., (2016) with a systematic review suggests multiple strategies of reducing MH stigma: (1) positive attitude change showed short-term benefits while knowledge improvement had lesser evidence (2) group-based anti-stigma inventions with mental illness seemed to be effective (3) social-contact based interventions for specific groups showed short-term improvement. More studies to investigate other influencing associated factors of MHFA is necessary.

Limitation

MHFA consists of 11 different courses including those that target adults, adolescents, public safety, veterans, and elders. The outcomes may not support for each subtype of MHFA because it does not specify which course the participants have completed. The validity of the

current study might be limited since the samples were not required to prove their participation,

such as by providing their certificates of MHFA, although they were asked several times if they

had completed MHFA course throughout the survey. The findings of the present study may not

be properly adapted because the current study collected NY residents only, meaning that the

effectiveness of MHFA may vary in other states and countries. The current study is limited in

following the changes in MH literacy and stigma levels over time because it does not ask

participants the exact date of their MHFA completion. The level of MH literacy and stigma may

be different depending on how long it has been since the participants have completed the

program. For instance, one's MH literacy and stigma levels immediately after completing the

course may be significantly different from the levels after a year since completion. Thus, the

current study outcome may not reflect the effectiveness of MHFA precisely. The current study

results were calculated by comparing MHFA completers and non-completers. However, the

participants' previously existing stigma levels were not studied which makes it difficult to

compare the levels before and after completing MHFA. The current study differentiates a race in

a dichotomous way (Whites vs. other than White) because more than half of the samples were

Whites, meaning that data for individual races within the other than White group was not

specified. All samples were collected via Amazon MTurk and Qualtrics which possibly makes

the samples biased because it may require a certain level of skills and knowledge to use

computers, electronic compensation, and online access. Although the internal consistencies for

all scales in the present study were at acceptable levels, we did not specify effect sizes for the

relationships observed in the study. Lastly, MH literacy levels of all participants were measured

by using MHLS. However, MHLS may need further confirmation about itself because not many

studies have utilized this newly invented assessment tool yet.

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Table 1. Summary of Demographic Characteristics of the Study Sample ($N = 328$)

Variables	MHFA Sample n (%)	Non-MHFA Sample n (%)	p-value[b]	Total[a] n (%)
Gender				
Male	84 (53.8)	96 (55.8)	.72	180 (54.9)
Female	72 (46.2)	76 (44.2)		148 (45.1)
Race/Ethnicity				
European American/White	75 (48.1)	113 (65.7)	**.00**	188 (57.3)
Other than White	79 (51.3)	59 (34.3)		138 (42.3)
Age (Mean=33.6, SD=9.8)				
18-29 years old	68 (43.6)	61 (35.7)		127(39.2)
30-49 years old	72 (46.2)	94 (54.8)	.06	166 (50.4)
50 years old and over	12 (7.5)	17 (10.1)		29 (8.7)
Education				
< Bachelor's Degree	24 (15.3)	40 (23.2)		64 (19.5)
Bachelor's Degree	85 (54.5)	92 (53.5)	.11	177 (54.0)
> Bachelor's Degree	47 (30.2)	40 (23.2)		87 (26.4)
Marital Status				
Married or Partnered	91 (58.3)	62 (36.0)	**.00**	153 (46.7)
Single	65 (41.7)	110 (64.0)		175 (53.4)
RIBS-Reported				
Living with	72 (51.1)	62 (39.2)		134 (44.8)
Working with	73 (54.9)	59 (48.0)	.33	132 (51.6)
Neighbor	54 (45.4)	44 (43.6)		98 (44.5)
Close Friend	80 (57.1)	90 (61.1)		171 (59.2)

[a] The total sample size of each variable may not be the same as the total sample size of the study due to missing values.

[b] t-test *p*-values for binary variables and F-test *p*-values for categorical variables with more than two values.

Table 2. Correlation Between Demographic Variables, Mental Health Background, and Stigma-related Variables.

| | *Demographic Variables* | | | | | *Mental Health Background* | | |
	Age	Education	Race	Gender	Marital Status	MHFA	MHLS	RIBS-reported
Mental Health Background								
MHFA	.10	-.09	.17**	.02	.22**	-	.24**	.06
MHLS	-.01	-.01	.23**	.07	.26**	-	-	-.32**
RIBS-reported	-.06	.06	-.14*	-.17**	-.06	-	-	-
Stigma-related variables								
SSOSH	-.07	-01	-.05	-.08	-.16**	-.14*	-.55**	.12*
MIMS-P	-.01	.15**	-.15**	-.05*	-.23**	-.36**	-.65**	.16**
DSD	.06	.10	-.17**	-.11*	-.11*	-.05	-.50**	.27**
AQ-9 Schizophrenia	-.03	.17**	-.18**	-.04	-.23**	-.36**	-.56**	.15**
GASS	.00	.15	-.15**	.10	-.29	-.34**	-.61**	.04.
GASS Personal Stigma	-.01	.12*	-.18**	.01	-.35**	-.37**	-.79**	.16**
GASS Perceived Stigma	-.01	.13*	-.06	-.07	-.12*	-.17**	-.18**	-.12*
AMIS	-.01	.26**	-.12*	-.06	-.02	.00	-.15**	.09
AMIS Negative Stereotype	-.02	.19**	-.18**	-.06	-.12*	-.13*	-.61**	.19**
AMIS Recovery and Outcome	.00	.14*	.04	-.02	.10	.15**	.46**	-.09

Race (1=Other than White, 2=White), Gender (1=Male, 2=Female), Marital Status (1=Married, 2=Single), MHFA (1=Completed, 2=Non-Completed), MHLS (1=Lower Literacy, 5=Higher Literacy), RIBS-Contact (1=Contact, 2=Non-Contact), SSOSH (1=lower stigma, 5=higher stigma), MIMS-P (1=lower stigma, 4=higher stigma), DSD (1=lower stigma, 4=higher stigma), AQ-9 (1=lower stigma, 9=higher stigma), GASS Personal Stigma(0=lower stigma, 4=higher stigma), GASS Perceived Stigma (0=lower stigma, 4=higher stigma), AMIS Negative Stereotype (1=lower stigma, 5=higher stigma), AMIS Recovery and Outcome (1=higher stigma, 5=lower stigma)

All stigma-related variables have scales from lower stigma to higher stigma

*p<.05, **p<.01.

Table 3. Hierarchical Linear Regression of Mental Health Literacy and Stigma on Demographic Characteristics

Variable	MHLS β	MHLS ΔR^2	SSOSH β	SSOSH ΔR^2	MIMS-P β	MIMS-P ΔR^2	DSD β	DSD ΔR^2	AQ-9 β	AQ-9 ΔR^2
Step 1 (Demographic)		.23		.07		.12		.13		.13
Age	0.02		-0.10		-0.05		0.06		-0.07	
Education	0.08		-0.06		0.09		0.06		0.09	
Race[a]	0.23**		-0.08		-0.15**		-0.14*		-0.18**	
Gender[b]	0.07		-0.09		-0.05		-0.07		-0.05	
Marital Status[c]	0.31**		-0.21**		-0.25**		-0.11		-0.26**	
RIBS-Reported	-0.27**		0.10		0.11*		0.25**		0.10	
Step 2 (MHFA)		.26		.08		.20		.13		.21
Age	0.00		-0.09		0.00		0.06		-0.03	
Education	0.09		-0.07		0.07		0.06		0.08	
Race[a]	0.20**		-0.06		-0.10		-0.14*		-0.12*	
Gender[b]	0.07		-0.09		-0.05		-0.07		-0.05	
Marital Status[c]	0.26**		-0.19**		-0.16**		-0.11		-0.17**	
RIBS-Reported[d]	-0.29**		0.11		0.14**		0.25**		0.13*	
MHFA[e]	0.16**		-0.08		-0.31**		0.00		-0.31**	

RIBS = Reported and Intended Behaviour Scale, MHFA = Mental Health First Aid.
[a] 1 = Other than White, 2 = White. [b] 1 = Male, 2 = Female. [c] 1 = Married or partnered, 2 = Single. [d] 1 = Yes, 2 = No.
[e] 1 = Completed, 2 = Not Completed
*$p<.05$. **$p<.01$.

Table 3 Continued. Hierarchical Linear Regression of Mental Health Literacy and Stigma on Demographic Characteristics

Variable	GASS-Personal Stigma		GASS-Perceived Stigma		AMIS-Negative Stereotype		AMIS-Recovery	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1 (Demographic)		.20		.06		.11		.07
Age	-0.06		-0.04		-0.03		0.01	
Education	0.03		0.12*		0.14*		0.22**	
Race[a]	-0.20**		-0.10		-0.17**		0.06	
Gender[b]	-0.10*		-0.10		-0.07		0.00	
Marital Status[c]	-0.39**		-0.12*		-0.14*		0.17**	
RIBS-Reported[d]	0.10		-0.16**		0.14*		-0.09	
Step 2 (MHFA)		.27		.08		.11		.08
Age	-0.02		-0.02		-0.02		-0.01	
Education	0.01		0.12*		0.13*		0.22**	
Race[a]	-0.15**		-0.08		-0.16**		0.04	
Gender[b]	-0.10		-0.10		-0.07		0.00	
Marital Status[c]	-0.31**		-0.08		-0.12		0.13*	
RIBS-Reported[d]	0.12*		-0.15*		0.15**		-0.10	
MHFA[e]	-0.28**		-0.14*		-0.07		0.12*	

RIBS = Reported and Intended Behaviour Scale, MHFA = Mental Health First Aid.
[a] 1 = Other than White, 2 = White. [b] 1 = Male, 2 = Female. [c] 1 = Married or partnered, 2 = Single. [d] 1 = Yes, 2 = No.
[e] 1 = Completed, 2 = Not Completed
*$p<.05$. **$p<.01$.

Appendix A

MHFA Completers	MHFA Non-completers
IT IS VERY HELPFUL FOR ME It's good awareness program Mental Health cases are very complicated, some can recover and some may have recurring mental breakdowns, but as a normal human we should try to help them, and not run away from them. I find the program to be helpful, but the general public's perception of mental illness is still difficult to overcome. Mental Health First Aid teaches how to identify, understand and respond to signs of mental illnesses and substance use disorders. The course introduces participants to risk factors and warning signs of mental health concerns, builds understanding of their impact and provides an overview of common treatments. I found it incredibly helpful and would probably want to take it again in a year or two to brush up. I like how it de-stigmatizes seeking help. Mental health has various degrees, and most of these questions are too vague to grade in these levels.	My younger brother was under the "care" of a psychiatrist many years ago for depression. He attempted committing suicide several times prior to ultimately succeeding the final time with a shotgun. I wrestled with this for many decades before finally accepting it. However, to this day I am very skeptical as to the adequacy and effectiveness of mental health treatment. I think the program is very interesting and valuable. This is an important issue, especially given the chaos of today and how it is affecting people personally. Thanks for your research. I think this would be good for a lot of people to think about. Thanks I think everyone should take some type of course on Mental Illness to reduce stigma around the topic and spread knowledge. I found this interesting. I think many people with mental illnesses can be helped and integrated into society. I think this program could potentially help a lot of people, if those afflicted with mental illness are made aware of it. I find it quite intriguing and think it could be helpful