Effect of Contact-Based Education on Medical Student Barriers to Treating Severe Mental Illness: a Non-randomized, Controlled Trial

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Abstract

Purpose: Despite the intentions of educators to enhance medical students' ability to competently care for patients with severe mental illness (SMI), research suggests that students' affect, attitudes, and behavioral intentions related to working with SMI may be worsened during their training. There is a strong need to test interventions designed to reverse this effect. The authors conducted a longitudinal, non-randomized, controlled trial of the National Alliance on Mental Illness (NAMI) Provider Education Program—a 15-hour contact-based curriculum—on the affect, attitudes, and behavioral intentions of MS3 students at a single institution.

Method. Two-hundred and thirty-one students were invited to participate following completion of clinical rotations in psychiatry and other disciplines. Forty-one students participated in the curriculum and eighty participated in the control group (Response Rate = 52%). Participants in both conditions completed questionnaires assessing aspects of caring for patients with SMI at pre-test, one-week post-curriculum, and at 3-month follow-up.

Results. Linear mixed-models analysis indicated that, after accounting for differences between the two conditions owing to non-random assignment, there were statistically significant time by condition interactions across outcome variables. Participants in the educational program reported improved affect, attitudes, and behavioral intentions in working with SMI as compared to cohort-matched peers. These outcomes were maintained at 3-months post-intervention, with effect sizes in the medium to large range. The largest improvements were in the areas of attitudes and behaviors, specifically in attitudes toward the field of psychiatry and delivering compassionate treatment during acute psychiatric emergencies.

Conclusions. Although medical students typically receive core training in evaluation, diagnosis, and somatic treatments of patients with SMI, the nature of this training may not adequately address the affective, attitudinal, and behavioral barriers that hinder the provision of competent care. The present study suggests that a contact-based education program, especially when offered following the first clinical year of undergraduate medical education, may significantly ameliorate these barriers.

Patients with severe mental illnesses (SMI)—such as major depression, schizophrenia, and bipolar affective disorder—face between 13 and 30 years in reduced life expectancy when compared to the general population.[1,2] Despite advances in psychiatric knowledge and psychopharmacological treatments, this excess mortality rate has not decreased in the past 30 years and may in fact be increasing.[3] Numerous studies suggest that early mortality rates for this population are not due to the potential sequelae of mental illness itself (e.g. suicide), but rather to the poor management of comorbid common physical illnesses such as cardiovascular, metabolic, viral, and respiratory tract diseases.[4] Along with systemic issues such as a lack of time and an absence of integrated care,[5] the greatest barriers to management of these comorbid health concerns appears to be the attitudes of medical practitioners, stigma within the healthcare system, and inadequate screening and referral of comorbid conditions.[1,3,6]

Approximately 90% of patients with mental health concerns and 50% of patients with SMI use primary care exclusively for treatment of their psychiatric conditions.[7] Unfortunately, primary care physicians report just as negative—if not more negative—affect, attitudes, perceived self-efficacy, and behavioral intentions related to working with mental illness as the general public.[8–10] Surveys of primary care providers reveal that they are not immune to publicly-held stigmas; they are just as likely to believe that patients with SMI are responsible for their illness,[11] are dangerous and unpredictable,[12] and are less likely to adhere to recommended treatment protocols or recover from illness.[13] As a result, physicians generally desire greater social distance from their patients with SMI,[14] feel uncomfortable working with them,[10] and are less happy to have them on their caseload.[8] Ultimately, these attitudes and beliefs impact behavior, with primary care providers reporting not knowing how to cope with their own emotional reactions, effectively communicate,[10] integrate psychological treatment methods,[15] or

provide routine care to patients with SMI.[16] Indeed, providers report that their beliefs, attitudes, and perceived self-efficacy are greater barriers to providing care to patients with SMI than their lack of adequate medical knowledge per se.[10]

Unfortunately, these negative emotional reactions, attitudes, and behavioral intentions are often exacerbated, rather than improved, by undergraduate medical education.[17] This continues to be the case despite great awareness of this issue and numerous efforts by medical educators,[18] clerkship directors,[19] and residency training programs[20] over the past decade. Although medical students early in their training appear to have no less positive views of patients with mental illness than the general population,[21] typical pre-clinical medical education, which emphasizes the biopsychosocial model and describes the efficacy of psychiatric diagnosis and pharmacological treatments, may exacerbate stigma. For example, although biological perspectives of SMI etiology have been found to decrease blame by suggesting an organic cause of illness, they may unintentionally increase beliefs of dangerousness and pessimism about treatment due to implicating organic brain differences between patients with SMI and those with other health conditions.[22] Such training can further suggest that those with SMI must be treated by a radically different group of providers and interventions (i.e. psychiatry), and are therefore inappropriate for a general practitioner's care.[23]

Clerkship rotations, although greatly increasing knowledge of psychiatric treatment, appear to have little impact on improving affect, attitudes, or behaviors.[24] Clerkship sites often provide contact with patients in the most acute phase of their illness and are frequently too short in duration to observe a clinical course leading to recovery.[24] In addition, psychiatry clerkship rotations, like those in other specialties, may be further affected by mistreatment from superiors, poor role modelling, and social isolation.[25,26] Because of these factors, various studies have

found that stigmatization of those with SMI is actually at its *highest* point directly following the psychiatry rotation in the clinical years of undergraduate medical education.[27,28] This is particularly unfortunate given that medical education may be a "sensitive period" in the formation of attitudes toward stigmatized populations as early-formed attitudes are difficult to change among physicians.[29] In addition, the perceived discomfort of working with psychiatric illness that results from these early experiences may outweigh the intellectual content and quality of life that would otherwise draw students to consider psychiatry as a specialty,[30] although interest in psychiatry appears to have been increasing in recent years.[31]

Theoretical Background

An awareness of the presence of negative affect, attitudes, and behavioral intentions related to working with SMI in psychiatric training is well-established, and numerous interventions have been designed to address these factors. In a recent meta-analysis of various educational strategies, in-person contact with individuals with lived experience of SMI was found to lead to the greatest changes in all three outcomes.[32] Other educational strategies, for example providing factual information about SMI (termed "education") or highlighting unjust treatment of patients with SMI (termed "protest") appear to have some immediate impact on attitudes but little or no longitudinal impact on behaviors.[32]

Contact-based education is thought to operate through four primary mechanisms of action. These are 1) providing disconfirming information about a group, 2) offering a context for the repetition of new behavioral sequences with members of the group, 3) decreasing emotional arousal and increasing positive emotions when in contact with the group, and 4) re-appraising the superiority of one's own in-group toward greater humility.[29] Decades of social psychology research have also identified conditions under which contact-based education is most effective.

These include such things as similarity between contact population and audience, equal group status between the stigmatized group and learners, higher-order learning goals, structured activities which emphasize shared decision-making, and institutional support or endorsement of the activity.[33]

In addition to the importance of contact with patients with SMI, it has also long been recognized within academic psychiatry that interacting with families of individuals with SMI is an important antidote to the negative beliefs about the interpersonal etiology, or blameworthiness, of families in contributing to SMI.[34] Finally, it has become clear that interventions are most relevant and impactful when offered during the first clinical year, as that is the time when attitudes begin to crystallize.[20] However, the known intervention research appears to have been largely unstandardized, and little evidence exists on long-term outcomes of this education.[20] The current study is in response to this compelling need to design and evaluate a structured, contact-based curriculum involving patients with SMI and their families.

The Present Study

The present study sought to evaluate the longitudinal impact of the NAMI Provider Education program, a standardized, 15-hour contact-based program developed in line with the conditions thought to drive the efficacy of contact-based education.[29] The program was specifically designed to promote greater understanding of the impact of mental illness on individuals and their families and increase physician's behavioral willingness and ability to deliver patient-centered and collaborative care during psychiatric emergencies and in routine care settings. In particular, we were interested in evaluating the program across three primary areas; affect, attitudes, and behavioral intentions to care for individuals with SMI. These three domains are consistent with meta-analytic reviews in the area of stigma reduction[32] as well as the

Center for Disease Control's Knowledge, Attitudes, Beliefs, and Behaviors (KABB) model as applied to physician readiness to practice in such diverse areas as domestic violence,[35] self-vaccination,[36] and fetal alcohol spectrum disorders.[37] Although the NAMI Provider Education Program has been offered with initial success at the Menninger Clinic among a sample of faculty, staff, and administrators within an inpatient psychiatric unit,[38] the present study is the first evaluation of the NAMI Provider Education program among a medical student population.

Method

Procedures

All enrolled MS3 students were contacted by the dean of the medical school via e-mail to invite them to participate in the NAMI Provider Education Program, offered as an elective course following the completion of their first year of clinical rotations. The program was described as an opportunity to improve students' clinical skills related to caring for patients with mental illness. Participants who did not sign up to attend the NAMI training were invited to participate in the control arm of the study. All study procedures were approved by the institutional IRB.

After providing informed consent via Qualtrics survey, participants in both conditions completed a series of questionnaires assessing demographic information, personality traits, attitudes, affect, and behavioral intentions regarding providing psychiatric care (Time 1). Participants enrolled in the intervention condition then attended the NAMI training over a three-day period (15 total hours). The training heavily emphasized contact-based education (i.e., facilitators sharing their own personal/familial experiences with mental illness) while including a mixture of didactic presentations and group discussion (*Table 1*). It features a teaching team consisting of 3 trained facilitators including 1) a person living well in recovery from a SMI, 2) a

family member of someone with an SMI, and 3) a healthcare provider. Upon conclusion of the training, participants completed the same questionnaires that were used to assess affect, attitudes, and intentions as in the initial survey (Time 2). Participants in the control condition were contacted via e-mail to complete the Time 2 questionnaires. Twelve weeks later (Time 3), participants in both conditions were contacted via e-mail to complete the same set of measures to evaluate longitudinal outcomes.

[Insert Table 1 Here].

Participants

Two-hundred and thirty-one MS3 students were invited to participate. Frequencies, means, and standard deviations for the demographic variables and covariates for all participants are presented in *Table* 2. Overall, 133 students responded to the invitation (Response Rate (RR) = 52%). Initially, 44 participants elected to attend the training (RR = 19%) and 89 students elected to join the control condition (RR = 39%). Three students who signed up for the treatment condition did not attend the training or provide pre-intervention data. Nine students in the control condition did not provide usable Time 1 data. These cases were removed from the analyses, resulting in a final sample size of $N = 121$ (*Treatment* = 41, *Control* = 80).

Outcome Measures

There were three broad outcomes the NAMI provider education program aimed to address consistent with the KABB model. They each emphasize care for persons with SMI and their families and included affective (emotional) responses, beliefs, and behaviors. Although this conceptualization largely maps onto the KABB model, given that research has suggested that attitudinal barriers present the most significant barrier to adequate care provision[10] and that

psychiatric knowledge is assessed elsewhere in the curriculum, "knowledge" received less emphasis in measurement.[10]

Affect.

Day's Mental Illness Stigma Scale – **Anxiety** (DMISS)[39] is a 7-item scale which assesses anxiety concerning interacting with someone with a mental illness. A sample item is "I feel anxious and uncomfortable when I'm around someone with a mental illness." Respondents rated their beliefs on a 7-point Likert scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Higher scores indicate the presence of greater anxiety. Research has demonstrated the DMISS's sensitivity to change among healthcare providers through intervention.[40] The original study demonstrated evidence for internal consistency via Cronbach's Alpha (α) of 0.90. In our sample, Cronbach's Alpha was 0.86 at Time 1, 0.93 at Time 2, and 0.92 at Time 3.

Social Distance (SDS)[41] is a 12-item scale which measures desire for distance from an individual with schizophrenia. A sample item is "I could imagine making friends with someone who has had schizophrenia." Items were rated on a 7-point Likert scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*), with higher scores suggesting increased desire for distance. The original study demonstrated a range of Cronbach's Alpha (0.80-0.85). In our study, Cronbach's Alpha was 0.84 at Time 1, 0.90 at Time 2, and 0.90 at Time 3. Evidence for concurrent validity of the SDS in the present study was demonstrated by its positive association with anxiety concerning being in the presence of someone with a mental illness ($r = .37$, $p < .001$) and negative association with positive regard for people with SMI ($r = -.71$, $p < .001$).

Attitudes.

Medical Condition Regard Scale (MCRS)[42] is an 11-item scale that measures "the degree to which medical students find patients with a given medical diagnosis to be enjoyable, treatable,

and worthy of medical resources" (p. 257). The scale was designed to be used for any medical condition, and was validated for use with a variety of physical and psychiatric symptoms (e.g., hallucinations, suicidality). For the purpose of this study, we examined reactions to someone with auditory hallucinations and paranoid delusions. A sample item is "I feel especially compassionate for patients like this." Participants rated their beliefs on a 6-point Likert scale is rated from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). Five items are reverse scored, with higher values indicating more positive regard. The MCRS has demonstrated good evidence of validity[43] and sensitivity to change.[14] Test-retest reliability coefficient after a 17-day interval was reported as 0.84. Among a sample of medical students, Cronbach's Alpha for the scale was 0.87. In our study, Cronbach's Alpha was 0.88 at Time 1, 0.91 at Time 2, and 0.92 at Time 3.

Opinions about Mental Illness – Interpersonal Etiology (OMI)[44] We used the 7-item interpersonal etiology subscale in the present study to measure beliefs that interpersonal causes give rise to mental illness (5 items). The scale includes statements of belief such as the view that SMI can be attributed to the deprivation of affection during childhood, that people develop mental illness as an avoidance strategy, and that those with SMI cannot be successful at work. Respondents to the questionnaire rate their beliefs on a 6-point Likert scale from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). It has demonstrated good evidence of validity and sensitivity to change in recent intervention studies.[45] Among a sample of mental health professionals and medical students Cronbach's Alpha for the scale was 0.70 demonstrating adequate internal reliability.[46] In the present study, Cronbach's Alpha was 0.86 at Time 1, 0.91 at Time 2, and 0.91 at Time 3.

Attitudes Toward Psychiatry. The Attitudes Toward Psychiatry-30[47] is a 30-item scale designed to measure the attitude of medical students toward the field of psychiatry. The Likert-

type scale assesses eight attitudinal objects related to psychiatry that all load on a single factor: psychiatric patients, psychiatric illness, psychiatrists, psychiatric knowledge, psychiatric career choice, psychiatric treatment, psychiatric institutions, and psychiatric testing. A sample item is "Psychiatric teaching increases our understanding of medical and surgical patients." Respondents rate their attitudes towards each statement on a 5-point Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Several items are reverse-scored, and responses are calculated such that a higher score on the scale indicates a more positive attitude toward psychiatry. Validity for the ATP has been demonstrated via sensitivity to change following intervention.[47] Additionally, scale has demonstrated evidence of test-retest reliability among medical students. The internal reliability of the ATP-30 in the present study was 0.89 at Time 1, 0.91 at Time 2, and 0.93 at Time 3.

Behavioral Intentions.

Competent Caring. In consultation with the NAMI, the study authors developed a vignette and an accompanying 14-item scale intended to measure behavioral intentions in the treatment of SMI during an acute psychiatric emergency. The vignette focuses on a case of a middle-aged white male with schizophrenia arriving to the emergency room with paranoid delusions and auditory hallucinations urging violence. We asked participants to rate their level of agreement (1 = *Strongly Disagree,* 7 = *Strongly Agree*) concerning how they would approach the patient described in the vignette. Seven items are reversed scored, such that higher scores reflect behaviors demonstrating greater respect for patient autonomy, shared decision-making, and collaborative care. An example of a negatively-worded item is "I would request that a security guard be on standby before meeting with this patient." An example of a positively-worded item is "I would go out of my way to engage the patient's wife to get collateral information." Validity

for this measure was demonstrated by its correlations with theoretically-related variables such as attitudes towards psychiatry ($r = .52$, $p < .001$) and lower desires for social distance ($r = -.66$, $p < .001$). Cronbach's Alpha for this measure was 0.74 at Time 1, 0.77 at Time 2, and 0.74 at Time 3, suggesting adequate levels of internal reliability.

Integration of Counseling Skills. We used the 4-item Interest in Counseling[9] scale to measure interest in utilizing counseling skills as a part of routine care. A sample item is "Counseling patients about how to handle life stresses more effectively is an important role for family physicians." Participants reported their level of agreement on a 5-point Likert scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). Higher scores suggest increased desire to use counseling skills in routine care of patients. Research has demonstrated the scale's ability to differentiate between sexes in the area of integration of counseling in routine health visits.[9] In our study, increased desire to integrate counseling skills was related to more openness to psychiatric consultation ($r = .41$, $p < .001$) and perceived ability to provide competent care ($r = .29$, $p < .01$). Cronbach's Alpha for this measure was 0.64 at Time 1, 0.75 at Time 2, and 0.79 at Time 3, suggesting adequate levels of reliability as the study proceeded.

Psychiatric Consultation. We used the 4-item subscale from the Doctors' Attitudes Toward Collaborative Care[49] (DACC-MH) to assess medical students' willingness to collaborate with psychiatrists in caring for patients. A sample item is "I would like to know more about what psychiatrists have to offer in the management of medical or surgical patients." We converted the response format from "Agree" vs. "Disagree" to a Likert scale (1 = *Strongly Disagree*, 6 = *Strongly Agree*). Higher scores suggest increased levels of openness towards collaboration. Validity for the alternative-response format scale was demonstrated via relationships with more positive regard toward patients with SMI ($r = .57$, $p < .001$) and increased belief in ability to

provide competent caring ($r = .36$, $p < .001$). Cronbach's Alpha for this measure was 0.91 at Time 1, 0.93 at Time 2, and 0.94 at Time 3.

Covariates

Due to the non-random nature of our study design, we collected data at baseline on demographic and personality factors that could be theoretically related to interest in volunteering for the study intervention. These included gender, race, personal history of mental illness, history of receiving psychological help, and the Big 5 personality factors (emotional stability, extraversion, openness to experience, agreeableness, and conscientiousness).[50] We included these variables to help control for any baseline differences that may have existed between the treatment and control conditions.

Results

Descriptive Statistics

Means and standard deviations for Time 1-3 demographic and personality variables are displayed in *Table 2*. In order to test for differences between groups, we conducted a series of chi-square analyses. Research has recommended that chi-square analyses be conducted with at least 5 participants per cell.[48] Therefore, race was recoded into a binary variable (0 = White; 1 = non-White). Results suggested no group differences related to gender or race. However, participants who joined the NAMI group were more likely to have a history of seeking professional psychological help, $x^2_{1, 121} = 5.30$, $p = .02$. In addition, a series of independent samples t-tests on the Big Five personality factors revealed a difference in openness, with participants in the treatment condition reporting higher levels, $t_{119} = 2.49$, $p = .01$. To aid in interpretation, we also present descriptive statistics for the included outcome variables, along with sample sizes, by treatment condition at all time points in *Table 3*.

[Insert Table 2 here]

[Insert Table 3 here]

Main Analyses

Our primary research goal was to examine the immediate and longitudinal impact the NAMI contact-based education program. As time points were nested within individuals and individuals were nested within groups, we initially tested a series of Linear Mixed Models (LMM) using SPSS Version 25.0 following recommended guidelines.[49] LMM is a two-step form of multivariate regression. It assumes that repeated measurements for each subject follow a linear regression while allowing some regression parameters to be the same for all subjects and others to be subject-specific, depending on how the model is specified.[49] In addition to helping account for the nested nature of our data, LMM also accounts for differential spacing between time-points, unbalanced sample sizes, and missing data. For each analysis we conducted, we built mixed, two-level models with fixed effects of time and a dummy-coded condition variable to signify treatment group (0 = *control,* 1 = *NAMI curriculum*) and created a time * condition interaction term in order to examine differences between the two treatment conditions across time, the subject of our primary hypothesis.

We also included several other dummy-coded variables: gender (0 = *female*, 1 = *male*), race (0 = *White*; 1 = *non-White*), current mental illness (0 = *no,* 1 = *yes*) and experience seeking psychological help (0 = *no,* 1 = *yes*), specified as fixed effects in the analysis. Additionally, we included the Big 5 personality variables to control for any baseline differences that may have resulted from the non-random assignment of participants to condition. Data were estimated using Restricted Maximum Likelihood Model (REML) and an autoregressive covariance structure given estimates of model fit as compared to unstructured, compound symmetry,

diagonal, and other covariance structures. All post-hoc analyses were conducted using Bonferroni's correction. The results of this analysis are presented in *Table 4*.

[Insert Table 4 here]

With respect to the included covariates, being male was associated with increased beliefs that mental illness etiology was due to interpersonal factors ($F_{1,111} = 9.00$, $p < .01$), worsened attitudes toward psychiatry ($F_{1,111} = 9.00$, $p < .01$), and less desire to consult with psychiatrists during routine care ($F_{1,111} = 5.22$, $p < .05$) across time. Race appeared to predict anxiety involving being around someone with a mental illness, with non-White individuals reporting increased anxiety ($F_{1,115} = 7.62$, $p < .05$). Surprisingly, a history of mental illness or psychological help-seeking was not a predictor of any outcome.

When looking at personality factors, agreeableness did emerge as a significant predictor of positive regard ($F_{1,107} = 5.07$, $p < .05$) and perceived ability to provide competent care ($F_{1,108} = 4.66$, $p < .05$) across time. Extraversion, as expected, predicted lower levels of anxiety related to interacting with someone with a mental illness ($F_{1,109} = 8.81$, $p < .01$) and increased willingness to consult with psychiatry ($F_{1,101} = 4.00$, $p < .05$). These covariate relationships were controlled for in the Linear Mixed Model Analysis as reported in Table 4.

Overall, results demonstrate the efficacy of the NAMI curriculum in all three target domains suggesting both short- and long-term potency. See *Figures 1-3* for graphical representations of change over time on anxiety, attitudes toward psychiatry, and behavioral intentions during acute psychiatric emergencies. We chose one measure from each target domain we believe to be most proximal to provision of care.

[Insert figures 1 - 3 here]

In the domain of negative affect, participants did not differ on either target variable (i.e., anxiety, social distance) at baseline. However, participants who attended the NAMI curriculum reported lower levels of anxiety and lower desires for social distance at post-test and at 3-months later. In the domain of attitudes (i.e., medical regard, interpersonal etiology opinions, attitudes toward psychiatry), although participants who self-selected to attend the NAMI curriculum reported more positive attitudes at baseline, after controlling for these baseline differences, attending the NAMI curriculum was associated with improved attitudes for all three variables at post-test and at 3-month follow-up.

Finally, with respect to behavior (i.e., competent caring, integration of counseling, and willingness to engage in psychiatric consultation), participants did not differ on the competent caring measure at baseline but reported increased self-efficacy at each later time-point. Additionally, participants in both conditions reported similar desires to integrate counseling into routine medical care at baseline. Although those who completed the NAMI curriculum indicated increased desires at Time 2, this effect was not maintained at 3-month follow-up. Finally, results suggested that baseline differences in willingness to engage in psychiatric consultation remained the same at Time 2 and time 3 and were not affected by the intervention.

In order to estimate the effect size of the curricular impact at 3-month follow-up, Cohen's *d*—or the mean difference between conditions divided by the pooled standard deviation—was calculated for all significant outcomes, where values of < 0.20 are considered *small* effects, values of 0.50 are considered *medium* effects, and values of 0.80 are considered *large* effects.[50] The resulting effect sizes for significant outcomes were all resultantly in the *medium* to *large* range, where Cohen's *d* at 3-the month follow-up was 0.42 for Anxiety, 0.59 for Social Distance, 0.96 for Medical Regard, 0.78 for Interpersonal Etiology, 0.73 for Attitudes Toward Psychiatry,

and 0.72 for Competent Caring. Put differently, a Cohen's *d* of .96 would mean that 83% of

students receiving the NAMI curriculum were above the mean of the control with respect to how

enjoyable, treatable, and worthy of medical resources they viewed patients with SMI at 3-month

follow-up.

Supplementary Analyses

Perceived similarity between the contact group and audience is reported to facilitate more

successful stigma reduction.[33] To examine potential differences in the program's efficacy by

student demographics (for example, participating in the program may be differentially effective

for men and women), we built several, three-way time*condition interaction terms (e.g.

time*condition*race) for the included outcome variables. Results of these analyses revealed a

significant 3-way-interaction between time, condition, and gender in the domain of interpersonal

etiology, $F_{(2, 199)} = 3.69$, $p < .05$. Here, men reported more stigmatizing attitudes than women in

the control condition across all 3 time-points. In the treatment condition, however, men reported

more stigmatizing beliefs at Time 1, *Mdiff* = -.47, $p < .05$ but these differences disappeared at

Time 2 and remained non-significant at Time 3. In other words, although men reported more

negative beliefs regarding the interpersonal etiology of mental illness, the intervention was

successful in mitigating these between-gender differences. All other 3-way interactions with

race, mental illness, mental health help-seeking history, and personality were non-significant.

Discussion

The purpose of the current study was to examine the efficacy of the NAMI Provider

Education Program and its impact on medical students' treatment of patients with SMI. In line

with the intended goals of the NAMI curriculum and the CDC's model for prevention, we were

specifically interested in improving affect, beliefs, and behaviors among medical students in working with SMI during psychiatric emergencies and in routine care.

Results of the current study suggest that the NAMI Provider intervention was effective in improving outcomes in all three target domains at 12-week follow-up. Findings suggest that students who participated in the NAMI curriculum reported increased levels of positive affect (i.e., less anxiety, lower desire for social distance) and improved attitudes (i.e., toward people with mental illness, views of the etiology of illness). Additionally, participants reported increased intentions to utilize behaviors thought to reflect competent caring for a patient presenting with an acute SMI and behavioral intentions to integrate counseling into routine practice. A majority of these findings were sustained at 12-weeks post-intervention. Perhaps most importantly, we found that participants who attended the NAMI training reported improved behavioral intentions at both post-test and at 3-months when compared to participants in the control condition.

Supplementary analyses revealed that non-White participants reported more anxiety related to being around with someone with a mental illness, and that identifying as male was associated with worse attitudes and behavioral intentions. Although a body of literature has identified the role of culture and gender in influencing mental health attitudes, these findings deserve further attention given the sample is future health care providers. In addition, our findings provide early evidence of the program's gender-based success. Results suggested that the NAMI curriculum is especially successful in ameliorating negative beliefs about the interpersonal etiology of mental illness among men, as between-group differences disappeared post-intervention and remained non-existent at Time 3.

During rotations, medical students commonly interact with psychiatry patients during moments of behavioral and emotional crisis and have limited exposure to long-term treatment success, or to what the patients are like when they are well.[24] It is likely that medical students' attitudes (e.g., regarding recovery potential) are largely shaped by these interactions in an unintentionally detrimental version of contact-based education. Whereas this and other aspects of the medical curriculum may unintentionally foster an attitude that patients with SMI are fundamentally different in negative ways from physicians themselves, a structured, 15-hour contact-based program appears to help counteract this by creating for the students a more complete picture of what it is to live with SMI.

This is particularly important given that earlier intervention research in this area has used didactic education, personal testimony (a form of contact), and other reported stigma-reduction strategies with minimal success. Whereas many of these studies report increases in mental health knowledge post-intervention, few, if any, demonstrate sustained improvements in attitudes or behaviors.[51,52] It also seems likely that the length and depth of this 15-hour curriculum led to more significant changes than briefer interventions. The sustained improvements in the current study for up to 12-weeks post-intervention provides early evidence for the importance of this form of curricular programming.

Limitations and Future Research

Although results of the present study suggest that the NAMI Provider Education Program is an effective adjunct to medical education, the present study it is not without limitations. First, students were not randomly assigned to conditions. The data demonstrate two significant differences between participants who self-selected to participate in the NAMI curriculum and those who joined the control condition. Participants in the NAMI group reported higher levels of

psychological openness and had a more robust history of psychological help-seeking. Although

we attempted to control for these and theoretically-related differences in our analyses, it is

possible that there were other differences unaccounted for that may contribute to the changes

across time, indicating the change was not solely attributable to the intervention. For example,

the simple act of making the voluntary choice to participate may have made the participants

more open to changing. Second, while this study appeared to have sufficient power to detect an

effect using the Restricted Maximum Likelihood approach ($\beta = .98$), the study was done at a

single institution and had a modest sample size. Future research should seek to randomly assign

participants to conditions while increasing recruitment in order to verify the results of the present

investigation.

Another limitation of this study is the lack of observable behavioral outcomes and

restriction to 3-month follow-up. Previous research has utilized mental illness role-play

assessments to measure discriminatory behavior.[53] Given the long-term effects of our

intervention, future research should seek to measure medical student behavior in the clinic via

clinical observation data (e.g., during residency) and obtain healthcare outcomes with actual

patients. Related research may wish to examine whether medical students would benefit from

further "booster sessions" (e.g., at 6-month follow-up, prior to residency) as a way to solidify the

improved attitudes, beliefs, and behaviors.

Conclusion

Although there have been significant advances in the treatment of mental illness, patients

presenting with SMI continue to be vulnerable to inadequate medical treatment and early

mortality[3-4]. Research has noted the complex barriers these populations face in receiving

competent care for both psychiatric and general medical conditions. Although systemic issues

exist (e.g., underfunding), stigma toward individuals with SMI among medical professionals appears to impair certain critical treatment processes, including empathy[10] and adequate consultation and referral services[1,3,6] As such, there is a critical need to find ways to increase emotional competence and comfort when working with this population. Overall, our findings suggest the utility of the NAMI Provider Education program in reducing negative affect and improving attitudes and behavioral openness to patients with SMI. Given its short- and long-term effects, the program appears to meet its intended goals. Although adding 15 hours to an already-overcrowded medical curriculum is challenging, the time commitment may be necessary to allow for enough contact to generate lasting change. Future research should seek to continue examining its scalability consistent with contact-based research. Additionally, future work should examine its effects on medical student, resident, and physician behavior, and the influence on patient health outcomes.

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Table 1. Qualitative Description of NAMI Provider Education Program Methods & Topics

Class	Goal	Methods/Topics
1	Understanding the experience of mental illness	Introductions, overview of approach, discussion of privacy, teaching team shares crisis experiences
2	Supporting predictable emotions and needs	Principles of secondary prevention and intervention, impact of mental illness on the family and individual, critical needs exercise
3	Empathy's role in effective treatment	Secondary trauma for families and individuals, empathy exercise, stressors that complicate recovery, medication side effects, making treatment decisions, substance abuse comorbidity, self-harm and criminalization, completing our stories
4	Psychological elements of collaborative care	Stigma and the need for empathy, psychological trauma and illness, defensive self-esteem coping strategies, guidelines for offering empathy, perspectives from varied family roles
5	Applying collaborative principles	Navigating confidentiality, case study (applying collaborative principles exercise), reflecting on stigma, embracing meaningfulness in recovery, looking beyond medical disability, core practices in supporting recovery

Note. The NAMI Provider Education program is one of several national education programs developed by NAMI and is the intellectual property of NAMI. NAMI Iowa was responsible for providing the facilitators, materials and organizing the certification of completion. The medical school was responsible for providing the space, organizing the participants into groups, taking attendance, administering pre and post-test measures, and submitting the CEU's for all professional groups.

Table 2. *Frequencies, Means, and Standard Deviations for Demographics & Covariates*

	Treatment (*n* = 41) M (SD)	Control (*n* = 80) M (SD)	Total (*N* = 121) M (SD)
Age	26.90 (2.01)	26.88 (2.07)	26.90 (2.04)
Gender			
Female	25 (61%)	37 (46.25%)	62 (51.2%)
Male	16 (49%)	43 (53.75%)	59 (48.8%)
Race			
Asian/Asian-American	5 (12.2%)	13 (16.3%)	18 (14.9%)
Hispanic/Latino	2 (4.9%)	2 (2.5%)	4 (3.3%)
Middle Eastern/North African	1 (2.4%)	0 (0%)	1 (0.8%)
Multiracial	0 (0%)	3 (3.8%)	3 (2.5%)
White/European-American	33 (80.5%)	61 (76.3%)	94 (77.7%)
Prefer not to answer	0 (0%)	1 (1.3%)	1 (0.8%)
Current Mental Illness			
Yes	12 (29.3%)	17 (21.3%)	29 (24%)
No	27 (65.9%)	63 (78.8%)	90 (74.4%)
Prefer not to answer	2 (4.9%)	0 (0%)	2 (1.7%)
Help-Seeking History			
Yes	28 (68.3%)	37 (46.3%)	65 (53.7%)
No	13 (31.7%)	43 (53.8%)	56 (46.3%)
Personality Traits			
Conscientiousness	5.63 (1.16)	5.94 (1.03)	5.84 (1.08)
Agreeableness	5.34 (0.96)	5.06 (1.21)	5.15 (1.14)
Emotional Stability	4.90 (1.08)	5.26 (1.12)	5.14 (1.11)
Openness	5.27 (0.88)	4.76 (1.14)	4.94 (1.08)
Extraversion	4.17 (1.70)	3.84 (1.44)	3.96 (1.54)

Note. For descriptive statistics, data are presented in the following format: Mean (SD). For frequency statistics, data are presented as: N (%). One participant in the treatment condition did not provide their age.

Table 3. *Descriptive Statistics and Sample Size by Condition for Study Outcome Variables*

|	NAMI Curriculum									Control								
	Time 1			Time 2			Time 3			Time 1			Time 2			Time 3		
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
Anxiety	3.11	0.82	41	2.61	0.76	39	2.66	0.73	31	3.19	0.83	80	3.20	0.97	69	3.22	0.97	65
Social Distance	2.08	0.58	41	1.80	0.53	39	1.82	0.66	31	2.38	0.64	79	2.33	0.77	66	2.36	0.74	65
Medical Regard	4.69	0.55	41	5.01	0.59	39	4.99	0.59	31	4.17	0.68	80	4.27	0.71	68	4.18	0.80	65
Interpersonal Etiology	1.79	0.66	41	1.42	0.57	39	1.56	0.59	31	2.21	0.76	80	2.14	0.74	70	2.23	0.79	66
Attitudes Toward Psychiatry	4.07	0.37	41	4.24	0.37	39	4.41	0.43	31	3.80	0.39	80	3.85	0.41	67	3.80	0.48	65
Competent Caring	4.46	0.48	41	4.93	0.40	39	4.73	0.48	31	4.32	0.43	80	4.40	0.43	66	4.35	0.41	66
Counseling Integration	4.81	0.21	41	4.97	0.08	39	4.81	0.36	31	4.75	0.37	80	4.71	0.40	70	4.72	0.41	66
Psychiatric Consultation	5.37	0.54	41	5.60	0.52	39	5.52	0.61	31	4.87	0.87	80	5.02	0.70	69	5.07	0.83	65

Table 4. *Linear Mixed Model Analyses of the Effects of Treatment Condition on Study Outcomes*

	Affect		Attitudes			Behavioral Intentions		
	Anxiety	Social Distance	Medical Regard	Interpersonal Etiology	Attitudes Toward Psychiatry	Competent Caring	Counseling Integration	Psychiatric Consultation
	$F(df)$	$F(df)$	$F(df)$	$F(df)$	$F(df)$	$F(df)$	$F(df)$	$F(df)$
Intercept	1, 112 = 58.20***	1, 113 = 33.30***	1, 109 = 48.73***	1, 110 = 14.21**	1, 109 = 108.23***	1, 110 = 113.35***	1, 105 = 205.97***	1, 104 = 71.28***
Time	2, 201 = 6.27**	2, 198 = 4.29**	2, 197 = 11.19***	2, 201 = 9.95***	2, 196 = 9.56***	2, 196 = 29.52***	2, 197 = 5.48**	2, 193 = 6.01**
Condition	1, 112 = 1.91	1, 113 = 8.09**	1, 110 = 21.39***	1, 110 = 15.67***	1, 109 = 12.25**	1, 110 = 15.25**	1, 105 = 3.67	1, 104 = 8.12*
Time * Cond	2, 202 = 8.53***	2, 198 = 5.33**	2, 199 = 5.80**	2, 202 = 4.85*	2, 196 = 4.17*	2, 197 = 21.43***	2, 197 = 10.40***	2, 194 = 0.41
T1	*Mdiff* = -0.11	*Mdiff* = -0.16	*Mdiff* = 0.42**	*Mdiff* = -0.31*	*Mdiff* = 0.19*	*Mdiff* = 0.06	*Mdiff* = 0.05	*Mdiff* = 0.43**
T2	*Mdiff* = -0.37*	*Mdiff* = -0.45**	*Mdiff* = 0.68***	*Mdiff* = -0.62***	*Mdiff* = 0.32***	*Mdiff* = 0.50***	*Mdiff* = 0.25***	*Mdiff* = 0.43**
T3	*Mdiff* = -0.35*	*Mdiff* = -0.42**	*Mdiff* = 0.71***	*Mdiff* = -0.56***	*Mdiff* = 0.30**	*Mdiff* = 0.32**	*Mdiff* = 0.07	*Mdiff* = 0.30

Note. * = $p < .05$. ** = $p < .01$. *** = $p < .001$. Condition coded as (0 = *Control*, 1 = *NAMI Curriculum*). Gender, race, current mental illness, experiences of seeking psychological help, and the Big 5 personality factors were controlled for in the analyses.

Figures 1-3. Linear Mixed Model Analyses for the effects of treatment (vs. control) on Anxiety, Attitudes Toward Psychiatry, and Competent Caring Measures Across Time

Attitudes Toward Psychiatry

+3 SD

+2 SD

+1 SD

Sample Mean

-1 SD

-2 SD

-3 SD

Baseline   1 week   3 months

NAMI   Control
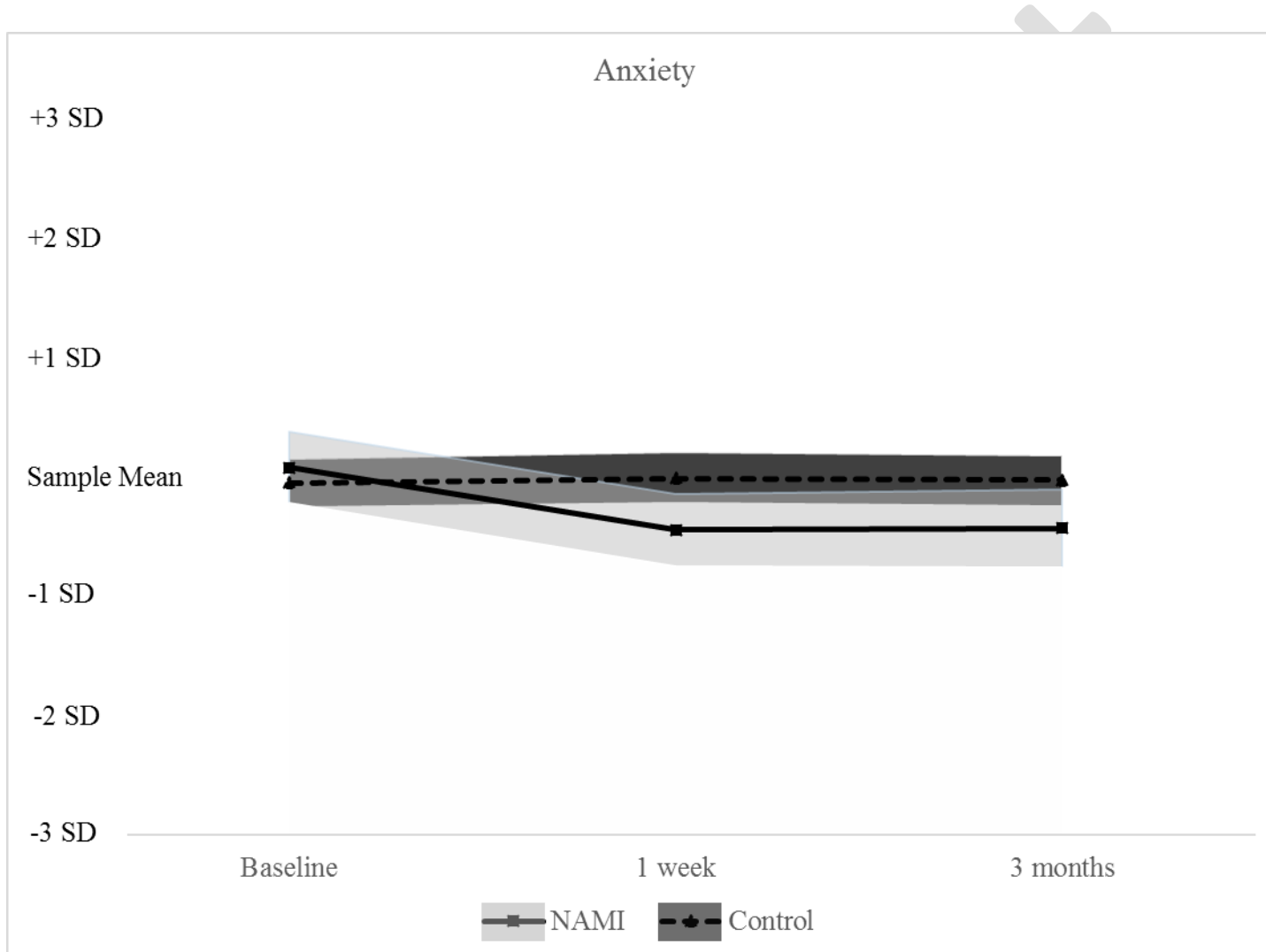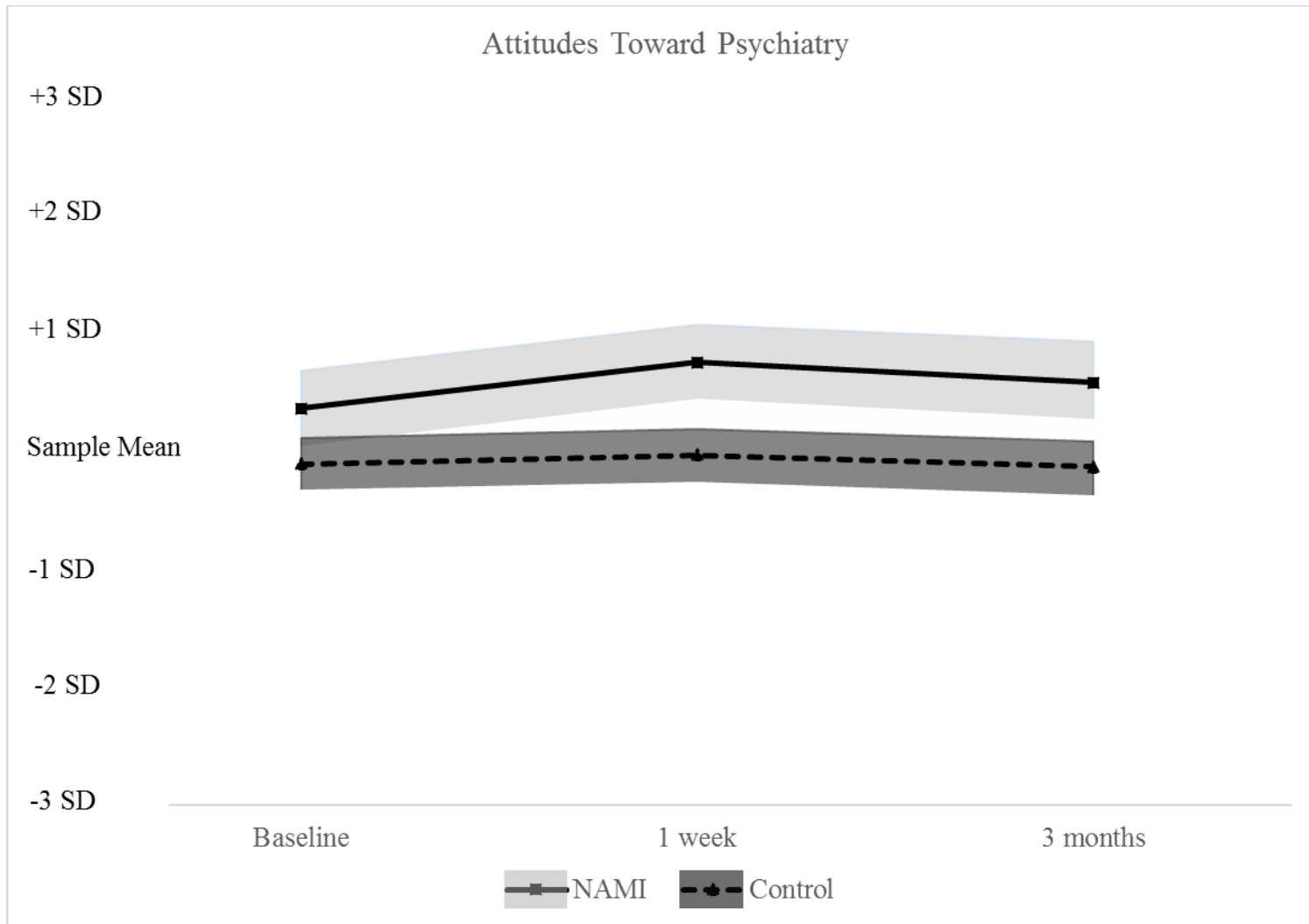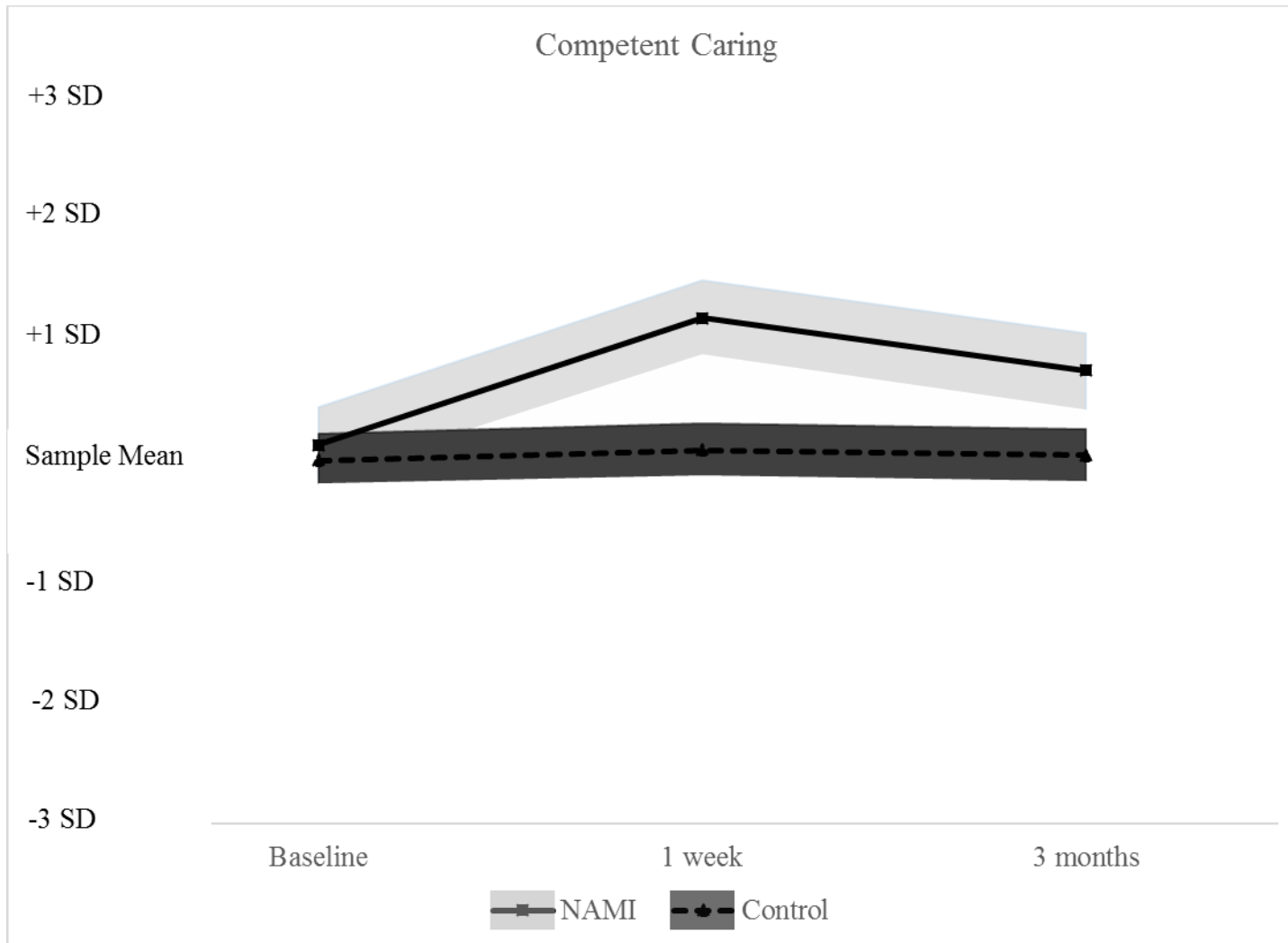
Note. Shaded bars represent upper and lower limits of 95% confidence intervals (CIs).