

Beliefs & Demand for Mental Health Services Among University Students*

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January 29, 2025

Abstract

This paper examines the factors shaping students' demand for mental health services and barriers to seeking support, drawing on a representative survey we conducted at a large university in Mexico. Screening questions for depression and anxiety reveal that nearly a quarter of students experience mental distress, yet only 29% of them sought professional help, highlighting a significant treatment gap—particularly notable given that 90% believe that going to therapy can substantially improve their own mental wellbeing and that 66% overestimate the share of peers who sought therapy. Moreover, cost and lack of personal time emerged as the primary barriers to therapy, far outweighing concerns such as fear of being judged by others, privacy issues, limited appointment availability, or not feeling therapy is necessary or useful. Finally, student respondents were exogenously assigned to treatment and control groups, with the treatment group receiving facts about mental health and therapy (including its long-term effectiveness, frequent use by those with mild or no distress, and no relationship between mental health and academic performance across students). Although treated students overall showed a lower willingness to pay for therapy than controls, among those with prior therapy experience, the effect reversed, resulting in a higher willingness to pay in the treatment group.

*We thank Prashant Bharadwaj, Craig McIntosh, Paul Niehaus, Frank Schilbach, participants at the Behavioral Economics student conference at Caltech and UCSD Applied student seminar series for helpful suggestions and comments. We thank Nicholas Kruus for their outstanding research assistance. We are grateful for financial support from the Weiss Fund. Batmanov: abatmanov@ucsd.edu, Grigoryeva: igrigoryeva@ucsd.edu, Calderon: bcalder2@itam.mx, González-Téllez: roberto.gonzalez@itam.mx, Guardiola: aguardiola@tec.mx.

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Introduction Plan [Ida, Alisher]

1. Motivation - treatment gap (why students)
2. Research question + what we do (short preview – hook)
 - limited data on youth or student mental health, especially in developing countries, with sparse representative samples
 - we survey a representative sample of nearly 700 students in a large private university in Mexico
 - we find that 23% are in distress, among whom 29% use therapy, constituting the treatment gap of over 70% of students in distress not using therapy
3. Treatment gap: distress and therapy use
 - awareness of own distress
 - perceived effectiveness (22 studies; therapy can improve wellbeing; long term effects - prior 1)
 - Evidence against attitudinal barriers being the main barrier?
4. Beliefs: inflating factor in the guess of therapy use
 - perceived therapy use (overestimate)
 - 45% used on-campus therapy themselves or know a friend who used
 - perceived stigma (open to share+guess; friends/parents would show support; likely to turn to someone for help)
 - overestimating is a rational best response to this belief
5. Further beliefs re: stigma (bring to incorrect priors)
 - actual and perceived stigma (MH and grades - prior 3; open to share+guess; others would show support; I would feel disappointed+guess)
 - how therapy demand varies by beliefs (lower for incorrect priors; not different for stigma)
6. Information intervention (treatments)
7. Info treatment results: link shares, advice, donation, wtp (counter-intuitive, inside/outside) + Heterogeneity sentence
8. Contributions

9. Outline

1 Introduction

Paragraph 1: motivation

Student mental health and wellbeing is an issue of growing concern, with rising rates of adolescent depression and anxiety and with suicide being the 3rd leading cause of death among 15–29 years-old's overall (WHO 2021). In a systematic review of studies of 36 college-student samples covering over 600,000 respondents (Mortier et al. 2018), the authors identify suicidal ideation in over 20% of students over their lifetime and in over 10% of students over the last 12 months. Based on the World Mental Health Surveys of adult population across countries, over 80% of people struggling with anxiety, depression or substance use disorders have **not** used any mental health services in the last 12 months (Patel et al. 2018), with this treatment gap reaching over 90% in most surveyed developing countries and specifically 95% in Mexico (Wang et al. 2007) – despite robust evidence of cognitive behavioral therapy (CBT) and other treatments being effective in reducing depression and anxiety (Cuijpers et al. 2013, 2016).

IG: Reducing the mental health treatment gap is particularly urgent given the far-reaching consequences of mental distress for human capital accumulation and other long-term economic outcomes (Ridley et al. 2020). Depression and anxiety – two of the most prevalent mood disorders¹ – can disrupt students' educational trajectories, shaping their employment prospects and socio-economic mobility throughout the rest of their lives. Facing the pressures of academic performance, career planning, and the transition to adulthood, college students may reap substantial benefits from getting professional help deterring most severe outcomes, yet, even in settings where mental health services are readily available, many individuals fail to seek or adhere to treatment (Patel et al. 2018, 2016), highlighting the need to better understand the behavioral and attitudinal barriers that sustain this gap.

To this end, we conduct our study...

In developing countries, the larger gap may be driven by more constraints in seeking and receiving professional mental health help compared to developed countries, from lack of mental health support services and financial constraints to personal and social stigma (Patel et al. 2017, Thapar et al. 2022, Barker et al. 2022, Haushofer et al. 2021, Bhat et al. 2022).

Paragraph 2: research questions and what we do

AB: In this paper, we collect novel data on 680 students from a large private university in Mexico to estimate the treatment gap, examine students' beliefs and misconceptions about mental health and professional help utilization, and assess the effectiveness of a light-touch information intervention in

¹Note that throughout the paper we will focus on mood disorders and more specifically depression and anxiety, where CBT and other talk therapy treatments have been demonstrated to be effective and can and often are provided by the university to students. We will not address more severe mental illnesses, such as schizophrenia or bipolar disorder, which typically necessitate more involved interventions combined with medications.

increasing therapy demand. To our knowledge, this is the first dataset to jointly capture both mental health conditions and therapy utilization, alongside students' *beliefs* and potential misconceptions about mental health and professional help, in a representative sample of university students in a developing country. By focusing on a high-ranked private university where mental health services are readily available on campus, we study demand for professional treatment in a setting with minimal supply constraints, providing a suggestive lower bound compared to students at public institutions, who face greater financial barriers and more limited access to care.

Paragraph 3: treatment gap and correlates

AB: Based on our analysis, there is a significant mental health treatment gap among university students in Mexico, despite the availability of on-campus counseling services. In our sample, 155 out of 680 students (23%) exhibit moderate to severe symptoms of depression or anxiety, with distress being more prevalent among those facing financial challenges, identifying as non-heterosexual, and advancing further in their academic programs. Notably, even though 80% of students in distress believe their university provides a good support system, nearly half of them have not received professional help in the past year. The treatment gap is significantly larger among male students and those reluctant to seek help or discuss their mental health.

Paragraph 4: beliefs – grades, stigma, etc.

AB&IG: Further analysis suggests that this gap is positively related to stigmatized beliefs, including perceived public stigma and the mistaken assumption that mental distress and grades are negatively correlated.

We find that many students underestimate other's use of professional mental health help and openness to sharing own mental health struggles, they overestimate self-stigma and associate students in mental distress with low academic performance, effectively having a more pessimistic outlook on public perceptions of stigma and other students views on mental distress.

Our results broadly echo the findings from previous experimental survey papers Roth et al. (2024), Ridley (2022), Ronak & Khandelwal (2024), Acampora et al. (2022)

Paragraph 5: further beliefs – stigma and priors

Our survey results suggest that the vast majority of students believe therapy is effective, and these beliefs do not differ by mental distress level, yet, there is a polarization in help-seeking: distressed students are both more likely to seek help but also more likely to avoid it altogether.

we find suggestive evidence of mental-health-related stigma as our respondents assume that students with poorer mental health have lower grades, while the data reveal that students' academic perfor-

mance and their current state of mental health are uncorrelated across survey participants.

We identify a particularly pervasive misconception in the belief by 75% of students that students in mental distress perform worse or much worse in classes (have a lower GPA), despite the actual data showing no such relationship. This is one of the stereotypes that may discourage students from revealing their struggles or seeking professional help, mirroring prior findings by [Ridley \(2022\)](#), who demonstrated that individuals similarly overestimate the impact of mental health on workplace performance.

Add about other misperceptions

By documenting these misperceptions and their potential role in perpetuating stigma,

6

in this paragraph, we can reference 2 Schardman's papers and Acampora's papers I think (if we still haven't before) + Vatsal's on India

A significant body of research has examined the factors contributing to the mental health treatment gap, with attitudinal barriers – such as perceived low need or skepticism about effectiveness – playing a central role ([Andrade et al. 2014](#), [Schnyder et al. 2017](#)). Beyond these direct barriers, underlying beliefs and misconceptions about mental health influence both stigma and help-seeking behavior ([Ronak & Khandelwal 2024](#), [Andrade et al. 2014](#)).

7

8

Main contributions:

A significant body of research has examined the factors contributing to the mental health treatment gap, with attitudinal barriers – such as perceived low need or skepticism about effectiveness – playing a central role ([Andrade et al. 2014](#), [Schnyder et al. 2017](#)).

Relative to Acampora:

- we focus on belief updating more systematically, and measure other social-related outcomes of MH discussions – propensity to share
- further reduce selection into the survey with advertising as the student experience survey and with financial incentives
- Treatment gap among students in a developing country
- Dev econ study interventions to study supply with limitations - peer provided, etc., often limited

is the supply - we document the T gap where supply is not the main constraint – able to study further the misconceptions conditionals on students having a free supply of services on campus and believing in their effectiveness etc – controlling for other barriers that have been the focus of other health-related behavioral interventions – while still living in a country with broader stigma

- Document beliefs and misperceptions among students – MH & GPA (MH & educational relationship) – NO CORRELATION

- Overestimates of prof help seeking + rationalization in stigma + inflation factor

- The positive causal effect of correcting MH-related misperceptions on sharing the MH resources w peers with some suggestive evidence on the substitution effect away from the demand for private therapy to on-campus resources

- Potential unintentional ramifications of information interventions through substitution channels

- Methodological contribution (advice?) + data

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The rest of the paper proceeds as follows. Section 2 describes the setting, survey design and data collection. Section 3 documents the prevalence of mental distress, professional help utilization, and the magnitude of the treatment gap. Section 4 presents evidence on student beliefs related to mental health, the effectiveness and prevalence of professional mental health support, and relationship between miscalibrated beliefs, stigma, and the demand for therapy. Section 5 presents the design and the results of our information intervention. Finally, Section 6 discusses the implications of our findings for policy and future research.

2 Student Survey [Bruno, Roberto]

2.1 Background and Setting

Mental health is an issue of rising importance and concern, with around 280 million people around the world diagnosed with some form of depression (World Health Organization 2021), accounting for about 5% of all adults suffering from this disorder. Based on several recent surveys (Healthy Minds Survey 2022), university students are experiencing even higher rates of depression and anxiety, drawing further attention to this population in research and supporting an unmet need for support (Abrams 2022). In Mexico specifically, mental health issues have gained increasing attention as a recent report by the OECD (OECD Report 2022) places Mexico among the top-3 OECD countries with the highest prevalence of depression post-pandemic (See Figure A1), indicating a concerning rise in the prevalence of mental health conditions in recent years.

While there are no systematic representative surveys of college students, one of the largest student surveys on mental health and wellbeing by coverage in the US identifies 44% and 37% of students struggling with depression and anxiety, respectively (Eisenberg et al. 2022). Furthermore, while over 80% of students report needing help, only 37% receive counseling, indicating a large potential treatment gap (Eisenberg et al. 2022).

In Mexico, there is limited data on mental health and wellbeing among young people and students in particular. A mental health survey—conducted in 2005—of a large representative sample of adolescents (12–17 year-olds, a sample of over 3,000 children) living in Mexico City reveals the prevalence in the past 12 months of any anxiety disorder at almost 30% and any mood disorder (including depression) at 7.2% (Benjet et al. 2009). To the best of our knowledge, the only systematically collected source of information related to mental health is the Mexican Health and Nutrition Survey (ENSANUT). While ENSANUT is representative at the national and regional² levels, it is limited in both the representativeness for subgroups of the population and the scope of questions related to mental health. In Figure A2, we show the distribution of a depression screening questionnaire³—consisting of questions such as “During last week, did you feel sad/depressed?”—for Mexicans in 2023 using the ENSANUT data.⁴ According to this screening, about 12% of the Mexican population and 10% of the population aged 17–28 scored above the half-score cutoff, consistent with experiencing such symptoms most or almost all of the days.

As university enrollments rise, growing attention is drawn to mental health issues among students, a demographic going through critical life transitions and often being in a vulnerable emotional state. In particular, there has been a growing concern over suicides in major schools, including important ones

²Regions are defined as a partition of the set of Mexican Federal States.

³While these are not standard questions used in measures such as PHQ-9 (Kroenke et al. 2001), they are similar and allow us to make suggestive conclusions about distress prevalence in Mexico.

⁴The distribution of depression screening scores in the region in which our partner University is located is similar to the National distribution.

in Mexico (Salud Mental 2022, Velazquez Hernandez 2017). As the number of university enrollments in Mexico surged by almost 50% from 2008 to 2022, reaching over 4 million students (Ministry of Education, 2023), an expanded demographic may be at risk, confounded by low availability of mental health services that are both affordable and effective. The mental health crisis is then further exacerbated by existing stigma and prejudice against recognizing mental distress and seeking treatment (Lagunes-Cordoba et al. 2021, Mascayano et al. 2016, Brewer et al. 2023).

For this project, we partnered with a large private university in Mexico with about 20,000 students⁵ on the site of our study to conduct our survey. While not as low-resource as an average public university in Mexico or any developing country, this institutional setting allows us to focus on the demand for MH services when supply is largely available through on-campus therapy. Additionally, the quality of the support system for students in need of professional help offered by the university is deemed good by 85% of our survey respondents, suggesting quality concerns are not an issue in our setting. This suggests that we would get a lower-bound estimate of the treatment gap and other potential miscalibrated beliefs compared to students from public institutions who both face more financial constraints, lack on-campus services in accessing therapy, and are more likely to be exposed to mental-health-related stigma.

Ida: we need Need to think more about the next paragraph:

AB: Emphasize that supply is steady on campus, and whatever we are measuring is a lower bound.

In this university, despite mental health support programs and counseling services, there are gaps both in awareness about the service existence and accessibility and their utilization, identified by both wellbeing staff and students themselves (elicited in our preliminary field visits). Students may not be seeking or adhering to treatment (as demonstrated in other settings by Patel et al. (2016)), indicating barriers beyond the availability of such services. These barriers include lack of awareness about the services and stigma—both public- and self-stigma—, manifested in lower willingness to recognize one's issues and seek treatment.

2.2 Survey Structure

Should start with a paragraph on the structure of the survey, main blocks – referring to the flowchart in Appendix.

AB: Implementation details (advertising, privacy, payments, duration) could be concisely summarized in one paragraph (+footnotes).

From November 14, 2024 to November 22, 2024, we advertised our online survey as a “Student Experience Survey”⁶ with the University students through four channels: (i) We asked academic program

⁵In 2021, the university was home to more than 16% of the State’s university students, with similar figures in the recent past. See <https://www.inegi.org.mx/app/tabulados/interactivos/?pxq=ac13059d-e874-4962-93bb-74f2c58a3cb9>.

⁶See Figure XXX in the appendix.

directors across the University’s departments to share the advertisement with their students (ii) We reached out to faculty directly asking for their help advertising the survey with their lectures’ students, (iii) We posted the ad to student groups on social network websites, and (iv) we used Instagram ads with an invitation to participate in the survey, targeting students located within the University’s premises. Importantly, to avoid biased measures of either own or perceived mental health distress due to final exams, survey responses were collected prior to the scheduled final exam period, which started on early December.

For alleviating privacy and confidentiality concerns while completing the survey, students were first required to create a Unique ID consisting of eight alphanumeric characters.⁷ This unique ID was used by a third-party to complete the payments, ensuring students’ personally identifiable information is not linked to their survey responses at any stage. This algorithm also helps us ensure that each response is a unique student record. To ensure that only students from the university we are working with complete the survey, respondents were redirected at the end of the survey to a separate form (not linked to their survey responses), where they recreated their Unique ID and provided their institutional university e-mail address.

Our final sample consists of 680 student responses after filtering out those who did not pass the attention check. Our survey had a median completion time of 21 minutes. Students could access the survey by either scanning a QR code, clicking on a hyperlink or directly accessing the survey link. Participants were incentivized to complete the survey through a combination of guaranteed payments, random lotteries, and performance-based bonuses. The first 100 respondents to complete the survey received a guaranteed compensation of \$200 MXN—about \$10 USD, and we informed respondents that 20 randomly-chosen participants would win a \$2,000 MXN gift card. Additionally, each participant answered eight bonus questions, one of which would be randomly selected for earning an additional \$50 MXN if answered correctly. These incentivized bonus questions were intended to measure beliefs about, e.g., *other* University students’ therapy usage, openness to share own mental health challenges, or share of University students who would be disappointed in themselves if they had mental health issues. To make WTP elicitations incentive-compatible, we tell students that we will select a few participants and implement their choices.⁸

Descriptive Statistics

Prior to the main discussion of depression and anxiety prevalence among students, we describe the main characteristics of our student sample and highlight its representativeness of the population we are studying

⁷The Unique ID was composed of (a) The first two letters of their mother’s name, (b) Their day of birth, starting with a “0” if their day of birth was on days 1–9 of the month, (c) The first two letters of their first last name and, (d) The last two digits of their phone number.

⁸We elicit WTP for therapy for oneself and WTP for therapy for a friend. The students whose choices were implemented were randomly selected, but no student was allowed to have both of his choices—therapy for oneself and therapy for a friend—implemented.

in Table 1. The majority of our subjects are undergraduate students, the mean respondent's age is 20 years, approximately half are female, 75% identify as heterosexual, and 69% receive some amount of scholarship. Both parents of more than 70% of the respondents have at least a Bachelor's degree.

Table 1: Survey Participant Characteristics

Variable	Mean	SD	Fields of Study	Population	Sample
Female (%)	51	50	STEM (%)	42	46
Age (Years)	20.2	1.9	Business (%)	25	18
Heterosexual (%)	74.9	43.4	Medicine & Health (%)	10	20
Pursuing Bachelor's (%)	91.2	28.4	Law, Econ, Government (%)	8	11
Full scholarship (%)	7.9	27.1	Creative Studies (%)	8	3
Partial scholarship (%)	69.1	46.2	Architecture & Environment (%)	7	2
Both parents w/ college degree (%)	71.3	45.3			

Notes: This table shows, on the left, sample means and standard deviations of student participants' characteristics and, on the right, the distribution of the University population and student sample across fields of study.

2.3 Main Outcomes

AB: One-two paragraphs summary, one sentence per outcome. Detailed description of outcomes and how we measure them, will go to Appendix A. The idea is not to repeat ourselves, briefly introduce outcomes so that the reader knows what's up, and if they are really curious they can go to Appendix and read details on outcome measurement.

Mental Distress [Alisher]

AB: I will turn this par into a sentence in a bit

We measure students' mental health using eight diagnostic questions from shortened versions of two widely used questionnaires. The PHQ-4 assesses the incidence of four symptoms of *major depressive disorder*, while the GAD-4 measures the incidence of four symptoms of *generalized anxiety disorder* over the past two weeks (Kroenke et al. 2001, Spitzer et al. 2006). Students' responses are quantified on a 0–3 scale for each question and aggregated into a distress index ranging from 0 to 24. A score of 12 or higher indicates moderate to severe symptoms, and we classify students meeting this threshold as being in distress.

Professional Help Use

AB: I will turn this par into a sentence in a bit

We measure usage of professional mental health services by directly asking respondents whether they are currently receiving professional mental health help and whether they have ever received such help in the past. About 24% of participants report currently receiving professional help, while 66% have received professional help at some point in their lives.

To understand the social context of mental health, we ask participants if they have friends who are currently or have previously received professional help. Moreover, participants are asked whether they believe a friend or someone they know closely would benefit from therapy. A significant majority of participants—87.6% and 89.4%, respectively—reported knowing a friend who has used professional help and believing that a friend would benefit from therapy. These findings suggest widespread recognition of therapy's relevance and value within students' social networks.

Students' Safety Net

To explore students' safety net when in distress, we ask participants whom they turned to for mental health support in case they needed it in the past 12 months. Among those who sought help, the most common sources of support were friends and family, with 57% and 41% of respondents selecting them. Furthermore, students feel both their friends and parents would support them if they told them that they are going to therapy, with an average agreement of 5.2/6 and 4.9/6, respectively, on a Likert scale.⁹

Beliefs About Mental Health and Help-Seeking

With our survey, we seek to identify the student knowledge and perceptions about:

Professional Help Information Sharing

discussion of how we collected clicks here

Peer Advice and Donation

This section examines participants' ability to provide advice to peers struggling with emotional challenges and their willingness to donate a portion of their earnings to support access to therapy for others. Participants were asked to imagine a scenario where a friend approaches them for emotional support due to personal struggles (advice). They were then prompted to provide open-ended advice, which was evaluated across multiple dimensions to assess the thoughtfulness, relevance, and overall quality of their responses. These evaluations help gauge participants' empathy, problem-solving abilities, and understanding of mental health support, providing insight into their capacity to engage in peer-to-peer support effectively.

In addition, participants were asked about their willingness to donate a percentage of their compensation to help fund therapy for others. Specifically, they were informed that their donations would be directed toward covering the cost of a therapy session for a fellow [University A] student who reported that financial constraints were preventing them from seeking therapy. Participants were notified that any donation they pledged would be automatically deducted from their payment and allocated toward this

⁹We ask them "How much do you agree with the statement *My friends/parents would show support if I told them I am going to therapy*" and responses range from *Strongly Disagree* (+1) to *Strongly Agree* (+6).

funded therapy session. This approach allowed us to capture participants' altruism and their support for increasing access to mental health services in a tangible, actionable way.

Together, these variables – open-ended advice and willingness to donate – highlight the interconnected roles of peer-to-peer emotional support and financial contributions in fostering a supportive mental health environment. They provide insight into students' attitudes toward helping others, both through direct advice and through reducing barriers to accessing professional mental health care.

We also need to explain the advice var for on-campus only – campus*therapy suggestion – a sentence is enough, more info can be in the appendix

Demand for Private Therapy

To assess whether our interventions have an effect on demand for therapy, we briefly introduce BetterHelp – an online therapy service that matches users with licensed therapists – before eliciting students' (incentivized) willingness to pay (WTP) for this service. The first step involves measuring respondents' willingness to pay for therapy for themselves. Students are asked to indicate the maximum amount they would spend on four weeks of therapy with BetterHelp, which is typically priced at approximately MXN \$6,500. To ensure responses are incentive-compatible, we inform participants that a subset of respondents will be randomly selected, and their choices will be implemented. In this implementation, a computer will bid an amount between MXN \$0 and MXN \$7,000 against the student's bid. If the student's WTP exceeds the computer's bid, they will receive four weeks of therapy for free. If the computer's bid is higher, the participant will receive an Amazon Gift Card valued at the computer's bid amount.

After eliciting respondents' willingness to pay for therapy for themselves, we extend the question to their willingness to pay for therapy for a friend. This question is structured similarly to the first but asks for the maximum amount participants would be willing to spend on four weeks of therapy with BetterHelp for their friend. This dual approach provides insights into both personal and altruistic demand for therapy services.

Additionally, if participants choose a WTP of zero, they are prompted with a follow-up question that elicits their willingness to accept (WTA) – how much they would need to be compensated to use this mental health tool. This mechanism addresses potential concerns about a high prevalence of zero WTP responses, which, while informative to some extent, could limit understanding of the spectrum of demand for mental health services and the barriers to utilizing certain treatments. Overall, this provides a nuanced measure of student demand for mental health resources. It also allows us to explore how actual and perceived stigma and discrimination against people seeking mental health treatment influence their willingness to seek therapy. By capturing both WTP and WTA, we aim to deepen our understanding of the psychological and social factors that drive or hinder engagement with mental health services.

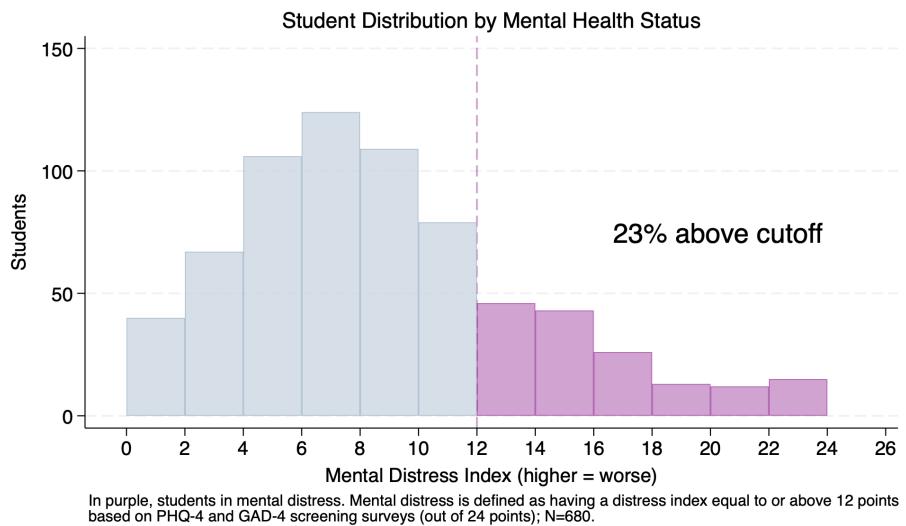
3 Student Mental Health [Alisher]

AB: I will rewrite this section to make it more concise, putting outcome measurement in Appendix A, and focusing here mainly on the results.

In this section, we document the mental health treatment gap in the student population of a Mexican university. First, we illustrate the prevalence of depression and anxiety in our sample based on mental health questionnaires (PHQ and GAD). To document the size of the treatment gap, we then show the incidence of professional help utilization by university students, distinguishing it from informal sources of support. Finally, we look at student observables that correlate with mental distress and examine heterogeneity in the magnitude of the treatment gap between groups, highlighting the role of stigma and larger gaps among men.

3.1 Mental Distress and Professional Help

Figure 1: Mental Distress Index Distribution



In our survey, PHQ-4 and GAD-4 each ask about four diagnostic symptoms of major depressive disorder or generalized anxiety disorder.¹⁰ Recent applications of PHQ and GAD in economic research include their use as tools to screen depression and anxiety among graduate students in economics departments in the US and their utilization to analyze the bi-directional relationship between poverty and depression in India (Bolotnyy et al. 2022, Ridley et al. 2020).

For our sample of 680 students, Figure 1 depicts the distribution of mental distress index values

¹⁰Four PHQ questions ask respondents how often over the past two weeks they have been bothered by ‘little interest or pleasure in doing things’, ‘feeling down, depressed or hopeless’, ‘feeling tired or having little energy’ and ‘feeling bad about yourself - or that you are a failure or have let yourself or your family down’. Four GAD questions ask respondents how often over the past two weeks they have been bothered by ‘worrying too much about different things’, ‘becoming easily annoyed or irritable’, ‘being so restless that it is hard to sit still’, and ‘feeling nervous, anxious or on edge.’

with higher values indicating poorer mental health. Given the right-skewed shape of the distribution, the mean distress index is around 8.4 out of 24 possible points, which is slightly above the median value of 8. In our sample, 155 students are at or above the 12 point cutoff for distress, constituting 22.8% of all students with a 95% confidence interval of [19.6%, 26%].¹¹ This shows that the prevalence of poor mental health in our sample of Mexican university students is substantial. To compare, during 2013–2016, 8.1% of American adults aged 20 and over experienced depression in a given two-week period, according to the Centers for Disease Control and Prevention (CDC) (Brody et al. 2018). In a large meta-analysis involving 44,503 participants aged 18 or older from 100 eligible studies, the prevalence of major depression was 10% (Negeri et al. 2021).

The global treatment gap for mental health is significant, with over 80% of people with common mental health disorders – rising to more than 90% in poorer countries – not receiving treatment despite the availability of cost-effective solutions (Chisholm et al. 2016).

Given a steady supply of counseling services in the university environment we are studying, it is not obvious ex-ante what the size of the treatment gap would be. The availability of and knowledge about services could, in principle, close the gap, but factors such as a lack of mental health literacy, stigma, and shame could, on the other hand, reduce demand.

Table 2: Professional Mental Health Help Use by Mental Distress

	Used Prof. Help	No Prof. Help	Total
In Distress	80	75	155 (23%)
Not in Distress	190	335	525 (77%)
Total	270 (40%)	410 (60%)	680 (100%)

We asked students in our survey about their use of professional mental health help in the last 12 months and, by splitting their responses based on whether they are in distress or not, categorized them in Table 2 into one of the four groups.¹² Out of 680 respondents, 270 report using professional help either on-campus or off-campus, meaning 2 out of 5 students in our sample receive some form of support from a mental health professional. Notably, when focusing only on those in distress, we observe that 80 out of 155 students (52%) with moderate or severe symptoms of depression or anxiety have not received professional treatment in the last year.¹³ Therefore, the estimate of the *treatment gap* in our sample of university students in Mexico is 79%. This indicates that 4 out of 5 students experiencing mental or

¹¹Using a more lenient cutoff of 10 points yields a hefty 34.4% of students in distress, with a 95% confidence interval [30.8%, 38%].

¹²Specifically, we asked students whom they had turned to for help with mental health challenges in the past 12 months and recorded the share who selected either the ‘mental health professionals at my university’ option, the ‘mental health professionals outside of my university’ option, or both.

¹³When splitting the components of distress, we find that around 31% of those exhibiting symptoms of depression and 26% of those exhibiting symptoms of anxiety have received professional help.

emotional challenges are not receiving the psychological help they could benefit from, even though 80% of these students agree there is a good support system on campus for students who need professional help for their mental or emotional health.¹⁴

Result #1: *In our sample of Mexican university students, 79% of those experiencing mental or emotional challenges are not receiving professional help, despite 80% of them believing there is a good support system on campus. This highlights a substantial treatment gap even in an environment with accessible mental health services.*

3.2 Predictors of Treatment Gap

This part talks about what observable characteristics are correlated with being in distress

Here, we discuss the observable characteristics in our sample that are correlated with mental distress. Several individual covariates exhibit notable differences between students in distress and those not in distress, as shown in Table 3. Students in distress are significantly less likely to identify as heterosexual (64.5% vs. 77.9%, $p < 0.001$) and are more likely to be in their third year or above (63.9% vs. 50.5%, $p = 0.003$). They also report higher financial stress (70.3% vs. 51.4%, $p < 0.001$), suggesting that economic concerns may contribute to mental health disparities. Additionally, students in distress are slightly older on average (20.4 vs. 20.1 years, $p = 0.042$), and the fraction of students identifying as female is higher among those in distress (56.8% vs. 49.3%, $p = 0.104$). Other factors, such as GPA, scholarship status, and parental education, do not show statistically significant differences between the two groups.

Table 3: Comparison of Individual Covariates By Mental Distress

	In Distress (n=155)	Not in Distress (n=525)	p-value
Female (%)	56.8	49.3	0.104
Age (years)	20.4	20.1	0.042
Heterosexual (%)	64.5	77.9	<0.001
Year 3 or above (%)	63.9	50.5	0.003
GPA (0–100 scale)	90.5	91.1	0.155
Full scholarship (%)	9.7	7.4	0.364
Partial scholarship (%)	67.7	69.5	0.674
Financially stressed (%)	70.3	51.4	<0.001
Moved from hometown (%)	58.1	61.9	0.390
Both parents with college degree (%)	51.7	48.1	0.445

¹⁴One could argue that a person in distress might not realize this, so even if they are aware that the campus provides support, they might not seek it. In our sample, 94% of those in distress report experiencing mental health challenges in the last 12 months (e.g., frequent stress, feeling anxious or down), which indicates a high level of awareness of their own mental distress.

In addition to the use of professional help, we also elicited respondents' perceived sufficiency of received support by asking them if in the past 12 months they received (i) *as much support* (counseling, therapy, or medication) as wanted, (ii) *less support* than wanted, or if they (iii) *were not seeking support* for their mental or emotional health. As Figure A5 in Appendix B portrays, 187 (133) students out of 680 report having received as much support as (less support than) desired. Strikingly, out of the remaining 360 people (53%) who reported not seeking support, 62 (17%) are in distress according to our mental health questionnaires. When asked about who they turned for help to in when experiencing mental health challenges, a vast majority of respondents reported

This par talks about distress heterogeneity by financial stress and perceived need for help.

This par talks about what treatment gap is correlated with – small table again? Can also discuss Figure A6 which shows that if not professional help, students tend to turn to family and friends for MH help.

- Treatment gap is larger among
 - Students not open to discuss MH issues with classmates ($\Delta 18$ pp)
 - Students not likely to seek MH help ($\Delta 9$ pp)
 - Male students ($\Delta 12$ pp)

Ida: I have some ideas here on how to show/present - we can discuss tomorrow (and I should probably finish my belief section first too haha) – but also check out the screenshot below - it is interesting how incorrect GPA prior is also associated with higher treamt gap

4 Beliefs and Demand for Mental Health Help (Ida)

some of these references and details will go into the intro

Previous research attributes the treatment gap primarily to attitudinal barriers, such e.g., perceptions of low need or low effectiveness of existing treatments (Andrade et al. 2014) despite rigorous and overwhelming evidence of their demonstrated effectiveness (Cuijpers et al. 2013), including in developing-country settings (Patel et al. 2017, Barker et al. 2022)¹⁵ and specifically for college students (Cuijpers et al. 2016). These barriers are related to and rooted in beliefs, potential misconceptions that people have about treatments for mental health issues (Ronak & Khandelwal 2024) (look for other references from that paper) and stigma against people in mental distress and/or those seeking such treatments (Schnyder et al. 2017).

4.1 GPA & Mental Distress

Stereotypes and misconceptions about mental health often shape beliefs about productivity and performance, which in turn influence individuals' willingness to disclose their mental health status. Furthermore, as seeking therapy may be perceived as a signal of poor mental well-being, some might feel discouraged from talking about their mental health struggles and accessing professional help. Prior research by Ridley (2022) found that people strongly believe workers experiencing mental distress perform worse on a communication-related task in an online experimental setting, yet his results demonstrate no actual difference in performance. Our exploratory field visits revealed similar patterns in personal anecdotes and in-depth interviews, constituting a prevalent stereotype that we have now document for our student sample: 75% respondents believe that the students in mental distress perform worse or much worse in classes compared to students not in distress – despite the actual data showing no such relationship.¹⁶. This perception may contribute stigma, discouraging students from sharing their mental health struggles or seeking therapy, potentially contributing to the treatment gap.

Figure 2 illustrates this discrepancy. The left panel shows that most students believe there is a strong negative relationship between mental distress and GPA. However, the right panel, based on actual data, reveals no meaningful correlation ($\rho = -0.05$). This systematic overestimation of the academic consequences of mental distress may reinforce stigma and discourage students from seeking help. ?? further explores how these misperceptions vary based on prior beliefs, underscoring the importance of targeted interventions to correct these mistaken assumptions and promote more accurate perceptions of mental health and academic performance.

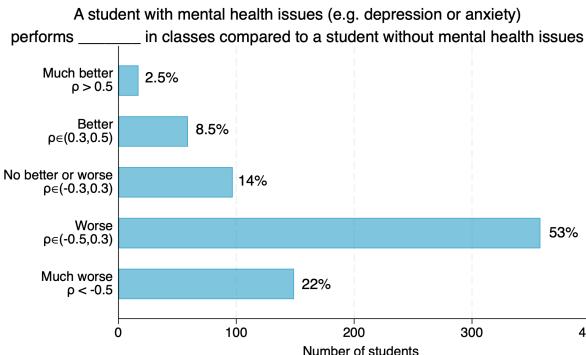
Note the tables below show an incorrect prior about GPA (or specifically assuming “worse” predicts

¹⁵For a more comprehensive review, see section 10.3 in Kremer et al. (2019).

¹⁶Specifically, we find that 75% of respondents predicted a strong negative correlation between mental distress and GPA in an incentivized question

Figure 2: Title

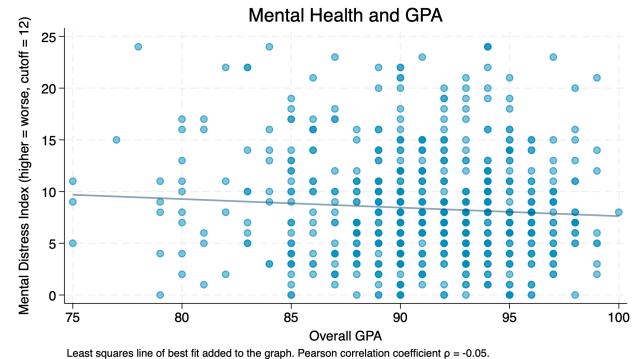
Distribution of Incentivized Student Guesses



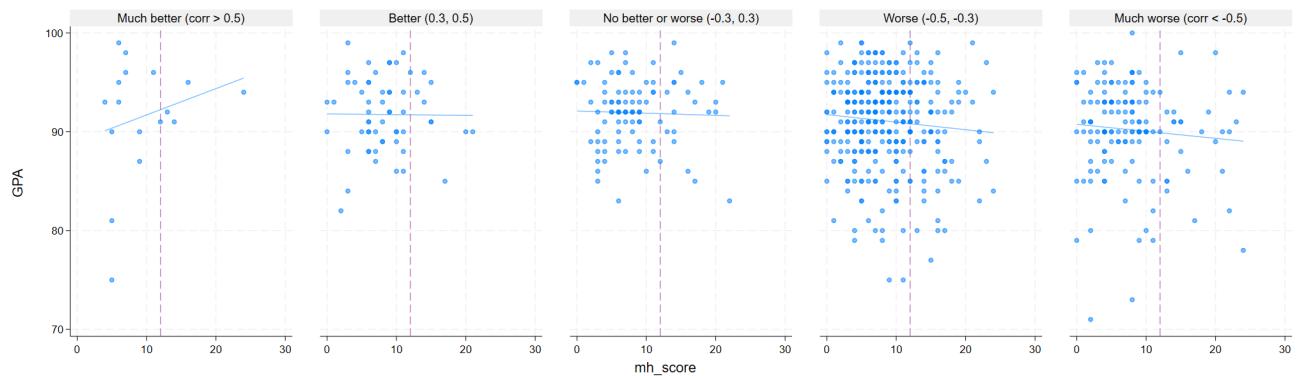
Most students guess relationship is negative (incentivized question)

Notes:

GPA & Mental Distress Across Respondents



No linear relationship observed ($\rho = -0.05$)



a larger treatment gap – ??

4.2 Perceived Therapy Effectiveness & Therapy Use

The perceived effectiveness of therapy is high, with over 90% agreeing that it improves both personal and general mental well-being. Additionally, strong social support for therapy is evident, as over 91% believe their friends would support them seeking therapy, and 87% report parental support. These findings suggest a generally positive attitude toward mental health treatment, both in terms of personal experience and broader societal acceptance. A majority (66%) of respondents have received professional mental health help at some point, and nearly 88% report having a friend who has sought such help. Among those who have sought professional help in the past 12 months, 40% did so, with about 20% receiving assistance at the university and 26% outside the university (there is a small overlap between two groups who have utilized both support resources).

Comment about 22 studies: histogram compared with Schwardman paper in Appendix – ours is slightly higher average?

```

.          /* prior GPA and treatment gap */
.
.          * correct prior guess *
tab gap_treatment if prior_3_mh_gpa_num == 3

Treatment
gap (1 = a
student in
distress +
no therapy) | Freq.    Percent     Cum.
-----|-----
0           | 14        66.67      66.67
1           | 7         33.33      100.00
-----|-----
Total       | 21        100.00

.
.          * correct prior guess OR "better" *
.          tab gap_treatment if prior_3_mh_gpa_num < 4

Treatment
gap (1 = a
student in
distress +
no therapy) | Freq.    Percent     Cum.
-----|-----
0           | 22        61.11      61.11
1           | 14        38.89      100.00
-----|-----
Total       | 36        100.00

.
.          * INCORRECT prior w "WORSE" *
.          tab gap_treatment if prior_3_mh_gpa_num == 4 | prior_3_mh_gpa_num == 5

Treatment
gap (1 = a
student in
distress +
no therapy) | Freq.    Percent     Cum.
-----|-----
0           | 58        48.74      48.74
1           | 61        51.26      100.00
-----|-----
Total       | 119       100.00

```

Add prior 1 % correct by distres (as a measure of effectiveness)

Main messages from the table by distress: (1) no difference in perceived effectiveness by distress - that is unlikely the driver of the treatment gap(not an attitudinal barriers, but others), (2) difference in take up and more students in distress unlikely to seek help than not - contributor to the gap (polarized in distress: more going to therapy, but also more unlikely to seek help among those who do not go

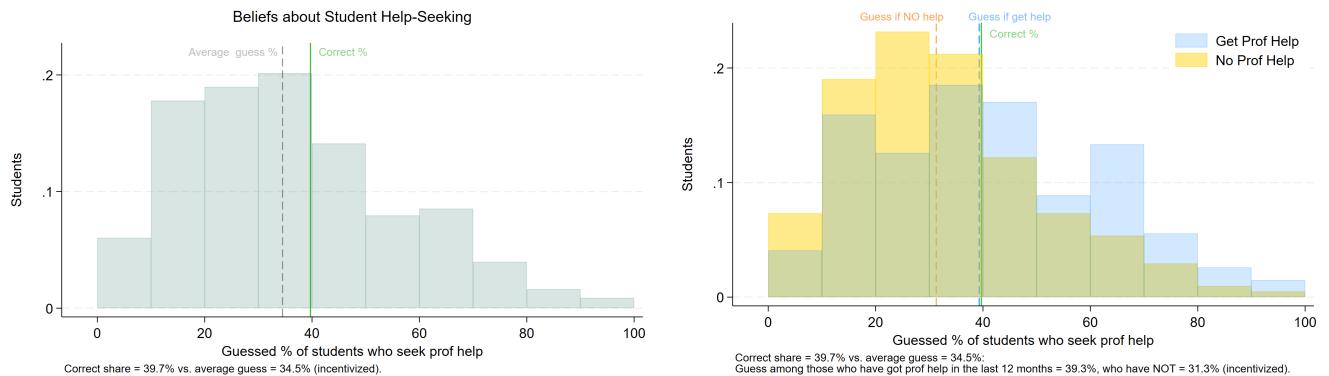
Move CDF to the appendix

Note the figure below: shows a (strong) positive corr in stigma and predicted therapy use – consistent with rationalizing based on own beliefs and assumed concealing rates (high stigma => more concealing)– ??

Table 4: Summary Statistics: Perceived Effectiveness and Acceptance of Therapy

Variable	Mean
Perceived Effectiveness of Therapy	
Agree: Therapy improves my own well-being	0.904
Agree: Therapy improves people's well-being	0.924
Agree with both	0.897
Perceived Support for Therapy	
Agree: Friends would support me going to therapy	0.913
Agree: Parents would support me going to therapy	0.872
Agree that both friends and parents would support	0.843
Professional Help Received	
Have ever received professional MH help	0.662
Have a friend who received professional MH help	0.876
Have a friend who would benefit from therapy	0.894
(Last 12 Months)	
Sought help from mental health professionals (last 12m)	0.397
→ help from mental health professionals at the university	0.203
→ help from mental health professionals outside the university	0.260

Figure 3: Title

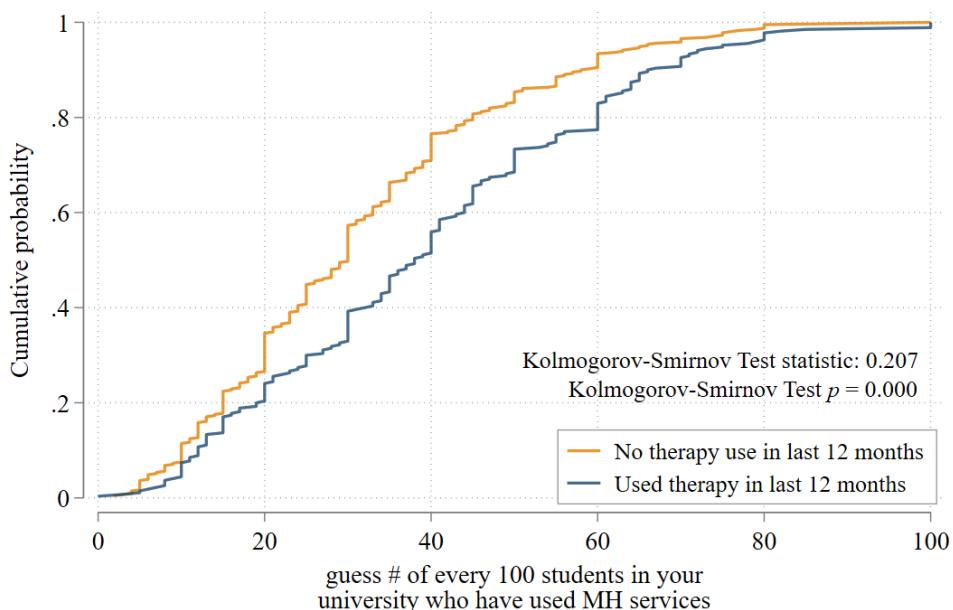


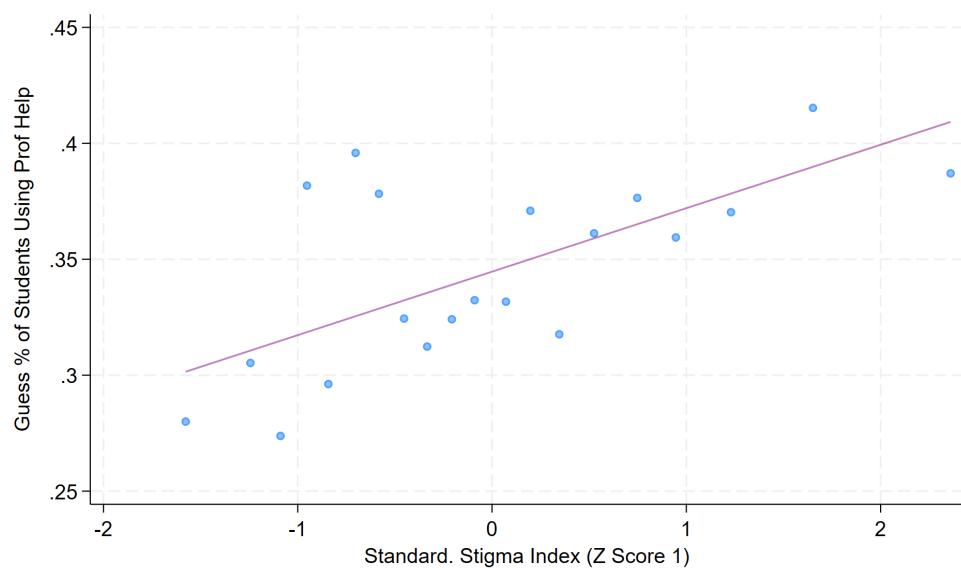
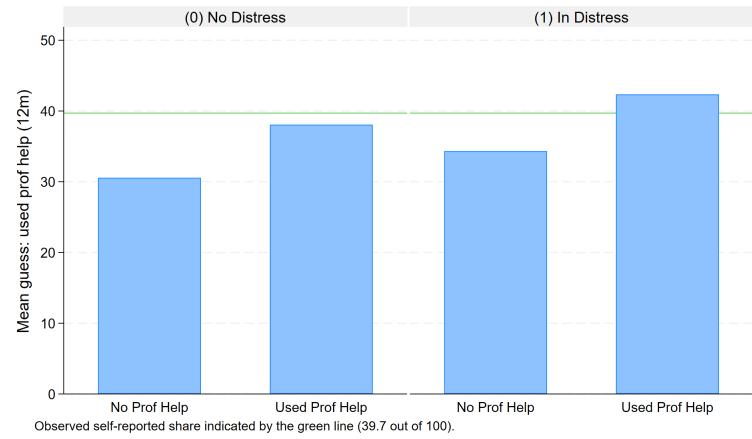
Notes:

Table 5: Perceived Effectiveness & Help-Seeking by Distress

	(1) Not in Distress Mean (SD)	(2) Distress Mean (SD)	(2)-(1) Pairwise t-test Mean difference
A. Perceived Effectiveness & Support			
Guess # studies ↓ depression (correct 22)	17.02 (4.39)	17.33 (4.32)	0.31
Agree: Therapy can improve my own well-being			
	0.90 (0.31)	0.94 (0.25)	0.04
Agree: Therapy can improve people's own well-being			
	0.92 (0.27)	0.94 (0.25)	0.02
Agree: Friends would support me going to therapy			
	0.91 (0.28)	0.92 (0.28)	0.00
Agree: Parents would support me going to therapy			
	0.88 (0.32)	0.83 (0.37)	-0.05*
B. Prof MH Help Use:			
Have a friend who received professional MH help	0.88 (0.33)	0.87 (0.34)	-0.01
Have a friend who would benefit from therapy			
	0.88 (0.33)	0.95 (0.22)	0.07**
Have ever received professional MH help			
	0.63 (0.48)	0.77 (0.42)	0.14***
Sought professional mental health help (last 12 months)			
	0.36 (0.48)	0.52 (0.50)	0.15***
→ professional MH help at the university			
	0.19 (0.39)	0.26 (0.44)	0.07*
→ professional MH help outside university			
	0.23 (0.42)	0.37 (0.49)	0.15***
Unlikely to seek help when struggling with mental health issues			
	0.15 (0.36)	0.28 (0.45)	0.13***

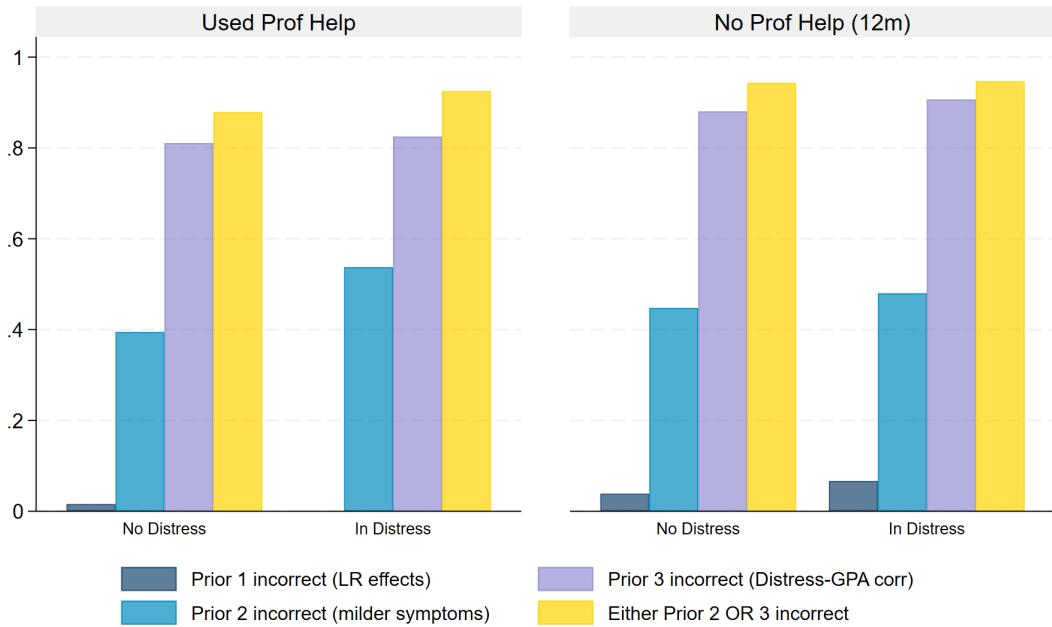
Notes: Difference = Distress - No distress. Sample size (680): No distress = 525, Distress = 155. . ***., **., * indicate 1, 5, 10% significance.



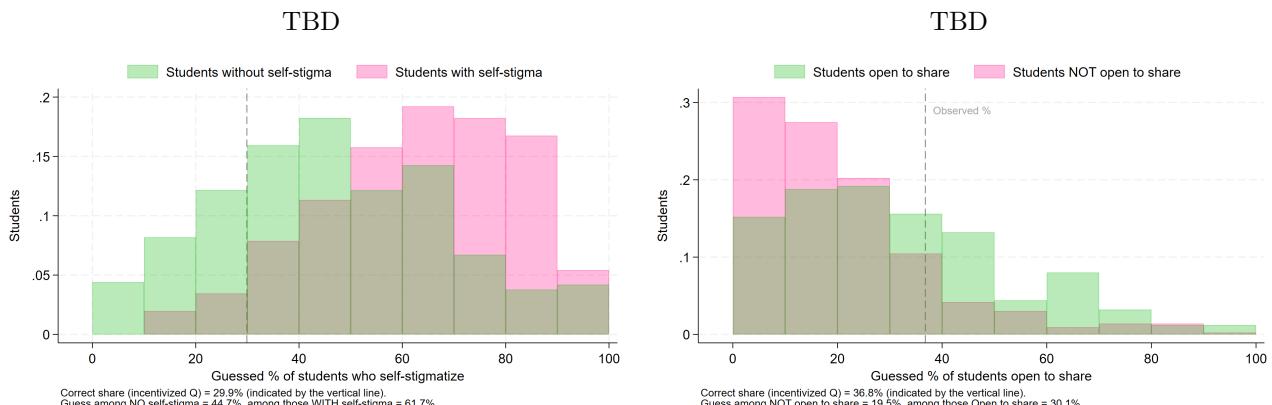


4.3 Prior Beliefs and Misconceptions

- higher misconceptions if in distress

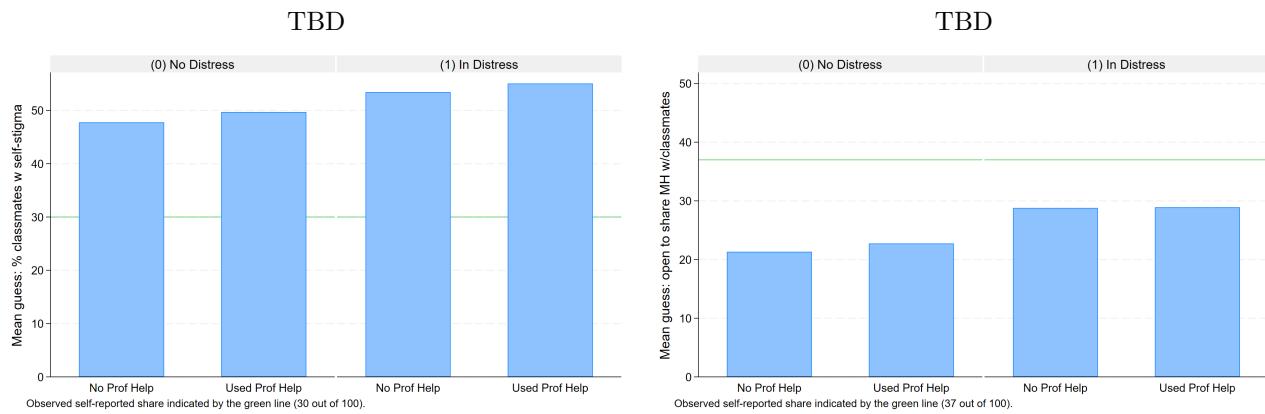


- higher misconceptions if in distress



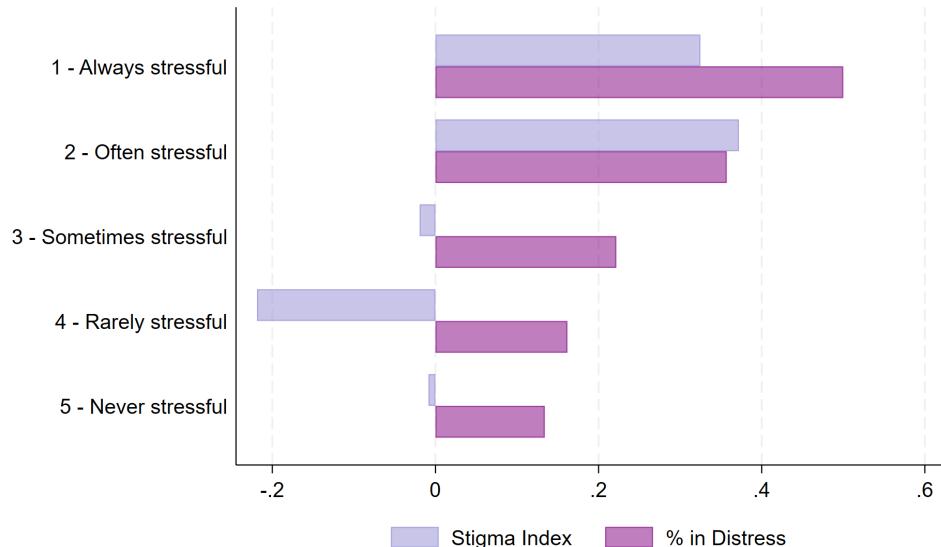
Edit 2 paragraphs below

Our data reveal a notable projection bias among respondents, wherein individuals' personal experiences and attitudes significantly influence their perceptions of their peers' behaviors. Specifically, students who utilized professional mental health services in the past 12 months estimated that 70% of their peers also sought such services, compared to an estimate of 45% by those who did not use these services. This 25 percentage point difference underscores how personal engagement with mental health services can lead to an overestimation of their prevalence among the broader student body. This aligns with [Bushong & Gagnon-Bartsch \(2024\)](#), who demonstrated that individuals often project their own behaviors onto others,



leading to skewed perceptions of social norms.

Similarly, the survey indicates that students who are open to sharing their mental health challenges believe that 65% of their peers are also open to sharing, whereas those less open estimate this openness at 40%. This 25 percentage point disparity highlights a consistent pattern of projection bias across different aspects of mental health attitudes. Understanding these biases is crucial for developing effective mental health interventions, as overestimation may affect the perceived availability of peer support and the overall stigma associated with mental health issues. Addressing these biases can lead to more accurate perceptions, fostering a supportive environment that encourages help-seeking behaviors among students.



4.4 Beliefs about Stigma

[Link & Phelan \(2001\)](#) conceptualizes stigma as the convergence of several components that can be mainly attributed to establishing human differences, highlighting undesirable traits and actively discriminating stigmatized individuals. [Brouwers \(2020\)](#) further classifies stigma at the individual, interpersonal, and structural levels. We measure stigma utilizing three different dimensions: (i) perceived stigma by parents, professors and other students which is broadly categorized as perceived public stigma; (ii) self-stigma; (iii) and personal stigma. Given the complexities of measuring stigma as a unified phenomena, we aggregate the aforementioned dimensions - composed by various variables - into a stigma index via the implementation of a Principal Component Analysis (PCA) ([Jaadi & Whitfield \(2024\)](#)). Subsequently, we seek to analyze the patterns of WTP for mental health services in different circumstances, with this more general measure of stigma. ¹⁷. The following tables provides a comprehensive description of the variables present across the 3 dimensions.

In this paper we consider different dimensions when talking about beliefs on stigma: (i) perceived stigma by parents, professors and other students which is broadly categorized as perceived public stigma; (ii) self-stigma; (iii) and personal stigma. By utilizing these three dimensions, and the variables within each one, we create a two stigma indexes using Principal Component Analysis (PCA) ([Jaadi & Whitfield \(2024\)](#)) using its first two components respectively

Table 6: Mental Health Stigma Variables

Variable Name	Definition
Perceived Public Stigma	
From students	Percentage of students that the respondent believes would view a student negatively for experiencing mental health issues like anxiety or depression.
From professors	Percentage of professors that the respondent believes would view a student negatively for experiencing mental health issues like anxiety or depression.
From parents	Percentage of student parents that the respondent believes would view a student negatively for experiencing mental health issues like anxiety or depression.
Self-Stigma	
Self stigma	Respondent's estimate of how many out of 100 students would feel disappointed in themselves if they had a mental health issue.
Personal Stigma	
Low GPA over MH symptoms	Dummy variable where it has a value of 1 if the respondent ranked low GPA as more acceptable than experiencing mental health distress symptoms; 0 otherwise.
Low GPA over MH talk	Dummy variable where it has a value of 1 if the respondent ranked low GPA as more acceptable than talking about mental health issues; 0 otherwise.

¹⁷We also utilized a weighted average approach, the details of both the PCA and the weighted average can be found in the appendix.

With the established dimensions for stigma we run a correlation of the created stigma index 1, from the PCA's first component, with each of its dimensions.

Table 7: Summary Statistics for Stigma Variables and PCA Indexes

Variable	Observations	Mean	Std. Dev.	Min-Max
Stigma Index PCA1	680	0.000	1.00	-1.93 – 3.47
Stigma Index PCA2	680	0.000	1.00	-0.80 – 2.66
Stigma Students (Std.)	680	0.000	1.00	-1.22 – 3.40
Stigma Professors (Std.)	680	0.000	1.00	-1.20 – 3.31
Stigma Parents (Std.)	680	0.000	1.00	-1.57 – 2.34
Guess Self-Stigma (Std.)	680	0.000	1.00	-2.20 – 2.21
Low GPA Symptoms (Std.)	680	0.000	1.00	-0.61 – 1.65
Low GPA Talk (Std.)	680	0.000	1.00	-0.40 – 2.50

Table 8: Correlation of Stigma Index PCA1 with Components

Variable	PCA1	Stigma Students	Stigma Professors	Stigma Parents	Guess Self-Stigma	Low GPA Over Symptoms	Low GPA Over Talk
PCA1	1.0000						
Stigma Students	0.8272***	1.0000					
Stigma Professors	0.8721***	0.6384***	1.0000				
Stigma Parents	0.8273***	0.5307***	0.6574***	1.0000			
Guess Self-Stigma	0.4950***	0.2953***	0.2674***	0.2525***	1.0000		
Low GPA Symptoms	-0.0850*	-0.0245	-0.0287	-0.0640	-0.0016	1.0000	
Low GPA Talk	-0.0415	-0.0086	0.0044	-0.0436	0.0407	0.4487***	1.0000

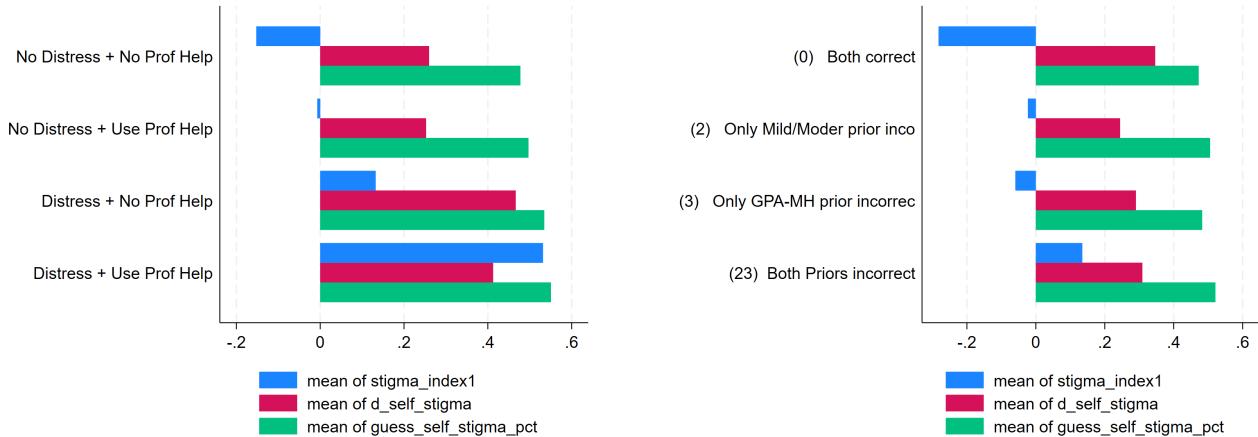
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The table above provides insights into the relationship between the first principal component of the stigma index 1 (PCA1) and its constituent variables. PCA1 is strongly and positively correlated with perceived public stigma variables, including perceived stigma by students ($r = 0.8272$, $p < 0.001$), professors ($r = 0.8721$, $p < 0.001$), and parents ($r = 0.8273$, $p < 0.001$). This suggests that PCA1 captures a substantial proportion of the shared variance in perceptions of public stigma across these groups, making it a reliable composite measure of perceived public stigma.

The correlation between PCA1 and self-stigma ($r = 0.4950$, $p < 0.001$) is moderate but significant, indicating that while self-stigma contributes to the index, it does so to a lesser extent than the public stigma variables. Interestingly, the personal stigma variables, represented by preferences for low GPA over experiencing symptoms or discussing mental health, show weak and negative correlations with PCA1 ($r = -0.0850$, $p < 0.05$ for low GPA over symptoms; $r = -0.0415$, not significant for low GPA over talk). These results imply that personal stigma is not strongly associated with the primary component of the stigma index and may represent a separate dimension of stigma.

Overall, PCA1 appears to primarily reflect perceived public stigma, with self-stigma playing a secondary role and personal stigma variables contributing minimally. This alignment with theoretical expectations validates the construction of PCA1 as a composite measure of stigma, with its strongest associations stemming from external perceptions of stigma by others (students, professors, and parents).

Figure 6: Stigma Measures Across Subpopulations



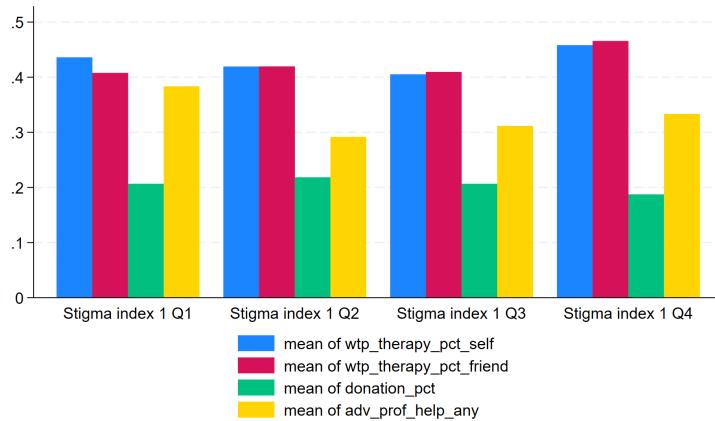
Notes:

The figure above highlights variations in stigma measures across different subpopulations, segmented by distress levels, professional help usage, and accuracy of prior beliefs. The stigma index (PCA1) is consistently lower for students who report no distress and for those who hold more accurate beliefs about mental health. This pattern suggests that both emotional well-being and correct priors are associated with reduced levels of perceived stigma, as captured by the index.

Additionally, the gap between self-stigma and the guess of self-stigma is notably smaller among those with correct prior beliefs. This indicates that students with accurate mental health knowledge are better calibrated in their perception of stigma, aligning their personal experiences more closely with their expectations of others. In contrast, students with incorrect priors or those experiencing distress show larger disparities between self-stigma and their guess of self-stigma. This could reflect a projection of personal stigma experiences onto broader peer groups.

The usage of professional help also plays a role: distressed students who seek help tend to show higher levels of perceived stigma but lower levels of self-stigma, possibly indicating a shift in self-perception due to engagement with mental health resources. Conversely, those who do not seek help exhibit higher levels of self-stigma, potentially due to internalized stigma or barriers to accessing support.

Outcome means by stigma index 1



The graph depicts the relationship between stigma index 1 (PCA1), which reflects perceived public stigma, and various mental health-related outcomes across its quartiles. Willingness to pay (WTP) for therapy for oneself seems to lightly vary across quartiles, although a clear difference emerges when comparing the lowest quartile (Q1) and the highest quartile (Q4), showing Q4 with an increased WTP for self. This suggests that individuals with higher perceived public stigma are more inclined to allocate financial resources toward accessing mental health services, potentially reflecting a heightened recognition of the importance of addressing mental health issues. WTP for a friend shows a similar trend, while donations do not seem to vary very much. Although, mentions of seeking professional help in advice given, show an inverse trend to previous outcomes, the lowest quartile (Q1) seems to have a high value of advice that fits said criteria as opposed to Q4; indicating that those who perceive Similarly, the proportion of donations allocated to mental health causes also rises with higher quartiles of stigma index 1, indicating that those who perceive greater public stigma are more likely to support mental health initiatives altruistically.

In contrast, the mention of seeking advice from professors for help remains relatively stable across the quartiles, showing minimal variation. This stability suggests that perceived public stigma does not significantly influence the likelihood of seeking academic support for mental health concerns. Overall, the findings highlight how perceived public stigma can drive financial and altruistic support for mental health while having a limited impact on help-seeking behaviors in academic settings.

Table 9: Correlation of Stigma Index PCA2 with Components

Variable	PCA2	Stigma Students	Stigma Professors	Stigma Parents	Guess Self-Stigma	Low GPA Over Symptoms	Low GPA Over Talk
PCA2	1.0000						
Stigma Students	0.0423	1.0000					
Stigma Professors	0.0433	0.6384***	1.0000				
Stigma Parents	-0.0260	0.5307***	0.6574***	1.0000			
Guess Self-Stigma	0.1125**	0.2953***	0.2674***	0.2525***	1.0000		
Low GPA Symptoms	0.8434***	-0.0245	-0.0287	-0.0640	-0.0016	1.0000	
Low GPA Talk	0.8504***	-0.0086	0.0044	-0.0436	0.0407	0.4487***	1.0000

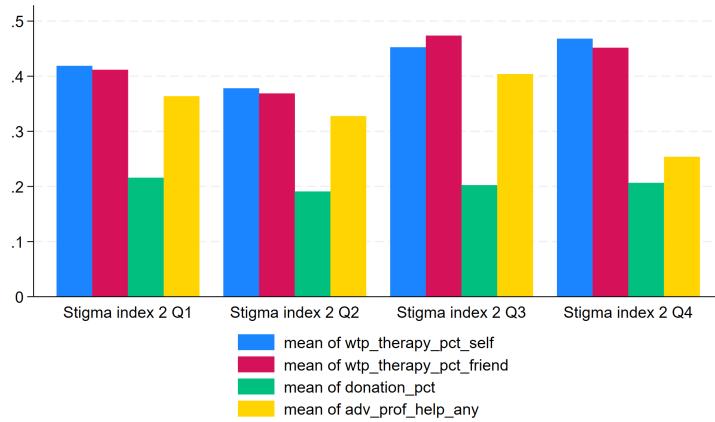
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The previous table shows the correlation of the second principal component of the stigma index

(PCA2) with its associated components. Unlike PCA1, PCA2 demonstrates a strong and significant correlation with the personal stigma variables. Specifically, it is highly positively correlated with preferences for low GPA over symptoms ($r = 0.8434$, $p < 0.001$) and low GPA over talking about mental health ($r = 0.8504$, $p < 0.001$). This indicates that PCA2 primarily captures the dimension of personal stigma, where respondents prioritize academic performance over acknowledging or discussing mental health issues. In contrast, PCA2 exhibits weak and mostly insignificant correlations with the perceived public stigma variables (stigma from students, professors, and parents). Correlations with stigma students ($r = 0.0423$), stigma professors ($r = 0.0433$), and stigma parents ($r = -0.0260$) are close to zero, suggesting that perceived public stigma contributes minimally to this component.

Interestingly, the correlation with self-stigma is weak but statistically significant ($r = 0.1125$, $p < 0.01$), indicating that while self-stigma has some relationship with PCA2, it is less central than personal stigma. This suggests that individuals with higher levels of personal stigma may experience slightly elevated self-stigma but remain less influenced by external perceptions of stigma. Overall, PCA2 reflects a distinct dimension of stigma, focused on personal attitudes and preferences regarding mental health, as opposed to perceived public stigma or self-stigma.

Outcome means by stigma index 2 (corr for low GPA over MH issues)



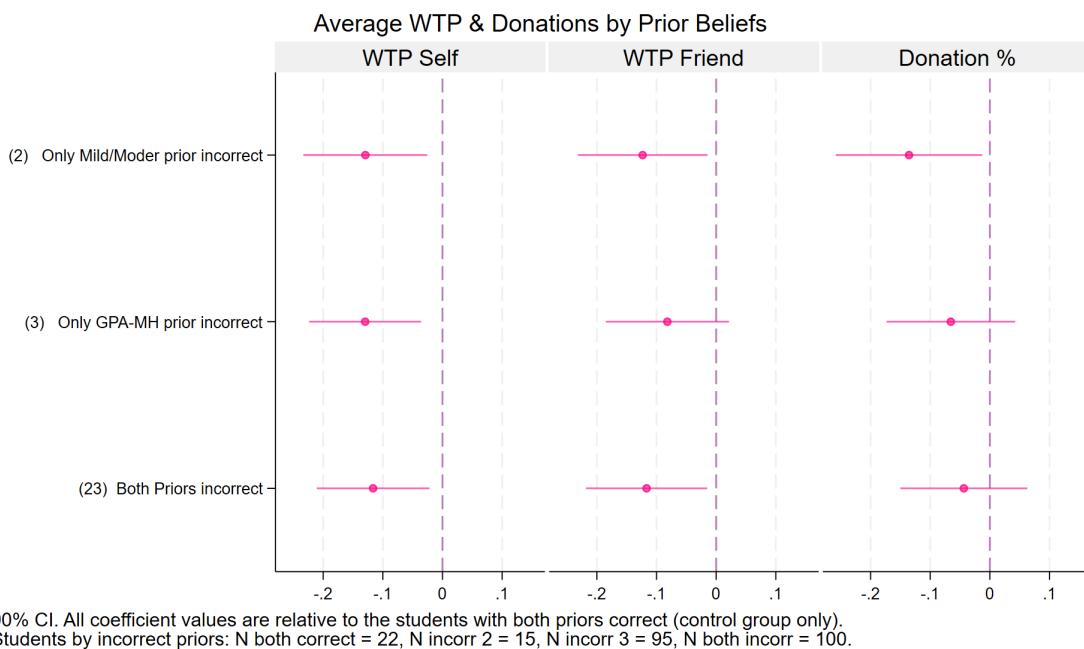
The graph illustrates the relationship between stigma index 2 (PCA2), which primarily captures personal stigma (i.e., a tolerance for low GPA being more acceptable than experiencing mental health distress symptoms or discussing mental health issues), and various mental health-related outcomes across its quartiles. Unlike stigma index 1, stigma index 2 shows minimal variation in the outcomes as the quartiles increase, suggesting no apparent differences in demand for mental health-related services or actions based on personal stigma levels. Specifically, the willingness to pay (WTP) for therapy for oneself and for a friend remains relatively stable across all quartiles, with only slight variations that do not suggest a meaningful trend. This stability implies that personal stigma, as captured by stigma index 2, does not significantly influence respondents' willingness to invest in therapy. Similarly, the proportion of donations to mental health causes and the likelihood of seeking advice from professors for help also

remain consistent, further underscoring the limited impact of personal stigma on these outcomes.

These findings align with the notion that personal stigma, reflected by prioritizing academic performance over acknowledging or addressing mental health issues, is not strongly correlated with behaviors related to seeking support or financially investing in mental health. Instead, personal stigma appears to represent a distinct dimension of attitudes toward mental health that operates independently of the demand for mental health services. This lack of association highlights the complexity of stigma and its potential dissociation from actionable mental health behaviors.

4.5 Demand for Therapy and Beliefs

- Average WTP and donations in the control group unaffected by the intervention



Ida: i can try to do 2x2 for below / above median stigma 1 and stigma 2 and a similar plot as above for demand

Add info on barriers?

Anti-Stigma Intervention

Maybe the text below might be useful from an earlier draft:

Our main exogenous variation in the experiment targets students' beliefs about mental health stigma. In the survey prior to the day of the experiment, in addition to answering a set of demographic questions (including PHQ-4 and GAD-4), we split participants into treatment ($D_i = 1$) and control ($D_i = 0$) groups with treated participants receiving a mix of **information** (Osman et al. 2022, Acampora

et al. 2022) and **perspective-taking** (Broockman & Kalla 2016) treatment with the information based on our baseline survey while control participants would be exposed to neutral information about generic student services. In particular, subjects in the treatment condition are exposed to a set of facts about prevalence of mental health issues among the student body of the same university that they attend in addition to survey respondents' elicited beliefs surrounding mental health stigma.

The perspective-taking component of the treatment directs subjects to think about the time they were judged negatively for being different, and then encourages them to see how their own experiences offered a window into mentally ill people's experiences with the hope to facilitate students' ability to take the perspectives of those struggling with depression or anxiety. We conjecture that the information + perspective-taking treatment would initiate subjects' active processing and reduce perceived mental health stigma. This could, in turn, decrease the subjective cost of revealing one's mental distress, $C(m_j)$, and the expected disutility of collaborating with a mentally ill teammate, $\hat{\mathbb{E}}(\gamma_j|M_j = 1)$.

5 Information Intervention

5.1 Treatment Design (Bruno and Roberto)

We combine two key components into a single brief intervention to test the sensitivity of the incentivized measure of willingness to pay (WTP) for a low-intensity mental health support service (BetterHelp app subscription) and several other belief-based outcomes related to seeking treatment. The intervention is evaluated by comparing outcomes between evenly split treatment and control groups in our survey sample, which consists of 680 university students.

The perspective-taking exercise is designed to engage participants in reducing prejudice and judgment about seeking help when experiencing mental distress, fostering empathy and encouraging a more supportive attitude toward mental health treatment. Meanwhile, the information component aims to address and correct potentially inaccurate or stigmatizing beliefs about seeking therapy. By integrating these components, the intervention seeks to influence both demand for mental health resources and broader beliefs and attitudes toward mental health support.

We implemented a field experiment with the 680 university students to test potential interventions aimed at reducing stigma and misperceptions related to mental health in general. The main objective of our treatments was to correct inaccurate beliefs—about who uses therapy and (lack of) mental health’s association with academic performance—by providing truthful information about the diagnosis of therapy users and the observed relationship between mental health issues and GPA. We designed our treatments in the spirit of a brief information treatment in the student mental health survey by [Acampora et al. \(2022\)](#) but focused on under-utilizing treatments. We additionally augment the treatment in one of the groups by including a reflection/perspective-taking exercise aimed at promoting empathy while reducing prejudice towards people in mental distress.

Treatment Groups

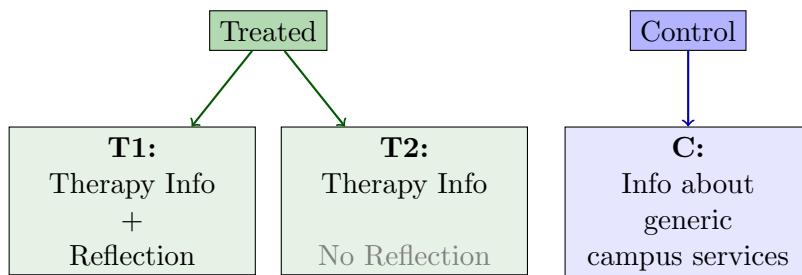
We randomly assign students into one of three possible groups: a control and two different treatment groups. Both treatments share a belief correction component, while only one of them also includes a component that focuses on reflecting about the situation of hypothetical students experiencing mental health issues.

- **T2: Information Only** ($N = 221$) Students in this group were shown three different sets of information in the form of infographics. The first infographic shows that a recent study found that offering psychotherapy leads to an 11% drop in mild depression and an 8% drop in moderate depression four to five years later. The second infographic showed information disclosing that “Among [University A] students who are receiving professional mental help, 2 out of 3 have only mild or no symptoms of depression and anxiety.” The third and last infographic showed that “Among

53 [University] students, 3 out of 4 respondents believe that a student with mental health issues performs WORSE or MUCH WORSE academically than a student without mental health issues. BUT our survey data show NO RELATIONSHIP between students' GPA and mental distress.”¹⁸

- **T1: Information + Reflection** ($N = 227$) Students in this group were shown the same infographics as the ones shown to students in the Information Only treatment. In addition to the infographics, students in this group were prompted with the following message: “Many university students sometimes struggle with feelings of being overwhelmed, anxious, or depressed. Based on your experience, what are some effective ways students can manage these types of mental health challenges? Please explain your thoughts.” Furthermore, we showed students in this group one of two vignettes¹⁹ showing an AI-generated image of a student and describing a hypothetical situation in which this student from [University] seeks help from a therapist after suffering a panic attack.
- **Control** ($N = 232$) Students in the control condition were not shown the infographics nor any of the vignettes.

Figure 7: Treatment Assignment



Notes: This figure depicts the assignment of students in our sample to the three experimental groups.

Importantly, students randomized into the Control condition or the Information Only treatment were also asked to tell us about their experience using on-campus services including sports facilities, academic counseling and career services in an attempt to hold mental effort during the survey completion comparable to that of the Information + Reflection treatment group.²⁰

Balance Table

Ida: Roberto, I made some tentative ones - they in the results/tables and are NOT formatted, but you can refer to them to get the list of variables Roberto: Thanks, I formatted them and uploaded them, can still edit if we want

In order to make causal claims relative to our treatments we rely on an unconfoundedness as-

¹⁸See Figures XXX and XXX in the appendix for the actual infographics shown to respondents.

¹⁹See Figure XXX in the appendix. The only differences across vignettes are the sex of the student appearing in the AI-generated image and the name of the student. We did this to rule out treatment effects being driven by the sex of the student in the hypothetical situation.

²⁰See Figure XXX in the appendix for the exact question.

sumption. That is, we need our treatment and control groups to be comparable on expected potential outcomes, so that any observed differences in outcomes can thus be attributed directly to treatment. To back up our assumption, in Table 10 we present evidence that treatment and control groups were not statistically different on average pre-determined covariates.

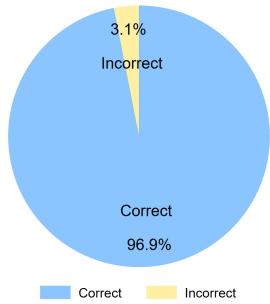
Table 10: Covariate Balance

Variable		(1) Control Mean/(SD)	(2) Treated Mean/(SD)	N	(1)-(2) Pairwise t-test Mean difference
	N		N		
Age	232	20.159 (1.848)	20.145 (2.031)	680	0.014
Female	232	0.461 (0.500)	0.536 (0.499)	680	-0.075*
Financially Stressed	232	0.530 (0.500)	0.571 (0.495)	680	-0.041
Has Scholarship	232	0.651 (0.478)	0.712 (0.453)	680	-0.061
Receives a full scholarship	232	0.082 (0.275)	0.078 (0.269)	680	0.004
Moved Residence	232	0.591 (0.493)	0.621 (0.486)	680	-0.030
GPA	232	90.897 (4.659)	91.007 (4.727)	680	-0.110
MH Score	232	8.569 (5.132)	8.237 (5.054)	680	0.332
Used Therapy L12 Months	232	0.233 (0.424)	0.234 (0.424)	680	-0.002
Open to Share MH Challenges	232	0.392 (0.489)	0.355 (0.479)	680	0.037
Self-stigmatize	232	0.323 (0.469)	0.286 (0.452)	680	0.038

Notes: This table shows balance on covariates across treatment groups. For each covariate we show each experimental group's sample mean and standard deviation, as well the difference in means across both groups. Age measures the respondent's age in years, female is an indicator equal to one if the respondent is female-born, financially stressed is an indicator equal to one if the respondent described her financial situation as "Always", "Often" or "Sometimes" stressful and equal to 0 if she reported it as "Rarely" or "Never" stressful, Has scholarship is an indicator equal to one if the respondent has at least some amount of scholarship, receives a full scholarship is an indicator equal to one if the respondent's scholarship covers 100% of tuition, moved residence is an indicator equal to one if the respondent moved her residence city to pursue her current studies, GPA measures the respondent's current overall GPA on a scale from 0–100, MH score measures the student's mental health score as described in section 2, used therapy in L12 months is an indicator equal to one if the respondent states having used therapy in the last 12 months, open to share MH challenges is an indicator equal to one if the respondent states she would be willing to share about her own personal MH challenges with others and self-stigmatize is an indicator equal to one if the respondent states she would be disappointed in herself if she suffered from mental distress. We pool T1 and T2 into a "Treated" group, but we present an analogous table without pooling treatment groups in Table A1 in the appendix. Standard errors for the difference in means test are heteroskedasticity robust. Significance levels: * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$

Prior Belief 1: Long-Run Therapy Effectiveness

Therapy has positive effects on reducing mild and moderate depression symptoms 4-5 years later?

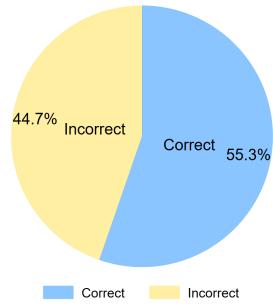


Correct answer:

Yes, positive effects 4-5 years later

Prior Belief 2: Who goes to therapy?

Do most students receiving professional MH support have mild or no symptoms of depression and anxiety?

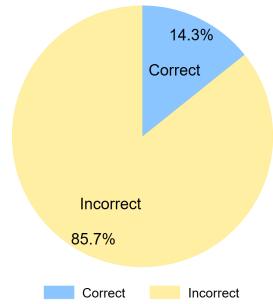


Correct answer:

Yes, most have mild/no symptoms

Prior Belief 3: Correlation between GPA & MH

Guess the relationship betw GPA and mental distress across students participating in this survey?



Correct answer: No correlation

b/n GPA & Distress

5.2 Empirical Strategy [Alisher&Ida]

Information Sharing

We consider two groups: a treatment group (T) with n_T individuals and a control group (C) with n_C individuals. Let k_T and k_C be the total observed clicks from the treatment and control groups, respectively. We wish to test whether the underlying click rates in the two groups differ. Since each participant in our study could generate an unbounded number of link clicks, we modeled the click counts using a Poisson process. Denote by λ_T the (unknown) rate of clicks per person in the treatment group and by λ_C the (unknown) rate in the control group. The null hypothesis asserts that both groups share the same click rate, i.e. $H_0 : \lambda_T = \lambda_C$, whereas the alternative is $H_1 : \lambda_T \neq \lambda_C$. In practice, this is often expressed as testing whether the *rate ratio* λ_T/λ_C equals 1.²¹

Given that our click counts are relatively small, in addition to running a test relying on large-sample approximations (Wald test, in our case), we also employed an *exact test* for two-sample Poisson comparisons (in the spirit of Fisher's exact p-value test on binomial data). Under H_0 , the total number of clicks $k_T + k_C$ is fixed, and the conditional distribution of k_T (the count in the treatment group) is binomial with parameter

$$p = \frac{n_T}{n_T + n_C}.$$

Thus, the test assesses whether the observed k_T is unreasonably large or small relative to this binomial distribution, thereby providing an exact *p*-value for the hypothesis $H_0 : \lambda_T = \lambda_C$.²²

In addition to the joint treatment (T1&T2) vs. control comparison, we separately tested other pairwise differences (e.g., T1 vs. control, T2 vs. control, and T1 vs. T2). For each comparison, the method returns (i) a *rate ratio*, $\hat{\lambda}_T/\hat{\lambda}_C$, estimated by the ratio of observed click rates, (ii) an *exact* two-sided *p*-value, and (iii) an indicator of whether we reject H_0 at 5% level. Unlike approximate Poisson methods, the exact approach remains valid even when k_T and k_C are small. However, it does not provide a confidence interval for the rate ratio in the current implementation; we therefore focus on *p*-values and the estimated ratio to interpret group differences in click rates.

Main Regression Specifications

To estimate treatment effects on our primary outcomes, we use two main regression specifications. These models evaluate the effectiveness of our interventions while accounting for potential confounders.

Our primary specification examines the pooled effect of any intervention (T1 or T2) compared to

²¹One could in principle model this environment as a comparison of two binomial random variables, where each observation can either result in success or failure. Thus, a binomial framework assumes a fixed upper limit on the number of "successes" each participant can contribute (e.g., at most 1 click per person). In our study, however, each participant could potentially produce multiple clicks, so there is no obvious upper bound. We, therefore, model such unbounded count data using Poisson distribution, with each group's total number of events (clicks) assumed to be $\text{Poisson}(\lambda_T n_T)$ or $\text{Poisson}(\lambda_C n_C)$, respectively.

²²We carried out the exact Poisson test using `statsmodels` in Python with the `method="exact-cond"` option.

the control group. The regression model is specified as follows:

$$Y_i = \alpha + \beta_1 InfoTreatment_i + X'_i \gamma + \epsilon_i,$$

where:

- Y_i represents the outcome of interest for individual i (e.g., willingness to pay for therapy, self-reported stigma, or advice quality index),
- $InfoTreatment_i$ is an indicator variable equal to 1 if individual i received any of the treatment conditions (T1 or T2), and 0 otherwise,
- X_i is a vector of baseline covariates, included to improve precision (e.g., gender, GPA, mental health score),
- ϵ_i is the error term.

The coefficient β_1 captures the average treatment effect of the pooled intervention on the outcome.

To disentangle the effects of each intervention (T1 and T2), we also estimate the following model:

$$Y_i = \alpha + \kappa_1 T_{1i} + \kappa_2 T_{2i} + X'_i \gamma + \epsilon_i,$$

where:

- T_{1i} is an indicator variable equal to 1 if individual i was assigned to the Information + Reflection treatment, and 0 otherwise,
- T_{2i} is an indicator variable equal to 1 if individual i was assigned to the Information Only treatment, and 0 otherwise,
- All other terms are defined as in the previous model.

In this specification, κ_1 and κ_2 measure the treatment effects for T1 and T2, respectively, compared to the control group.

Both models allow us to identify the impact of our interventions on key outcomes. The first specification focuses on the pooled treatment effect, providing a simple and intuitive estimate of the intervention's overall effectiveness. The second specification, on the other hand, enables us to compare the effects of the two distinct treatments.

5.3 Treatment Effects [Alisher & Ida]

Overview of the results - text

Only observe total – might be driven by a few people, be upfront about the fact we are testing equality of two parameters, and not two distributions.

Behavioral outcome – closer to real life, experimenter demand effect minimized, clear cost of taking an action, etc.

In the table, put total clicks into appendix and add info on actual number of clicks]

Counseling Information Sharing

Table 11: Poisson Test Results for Link Clicks

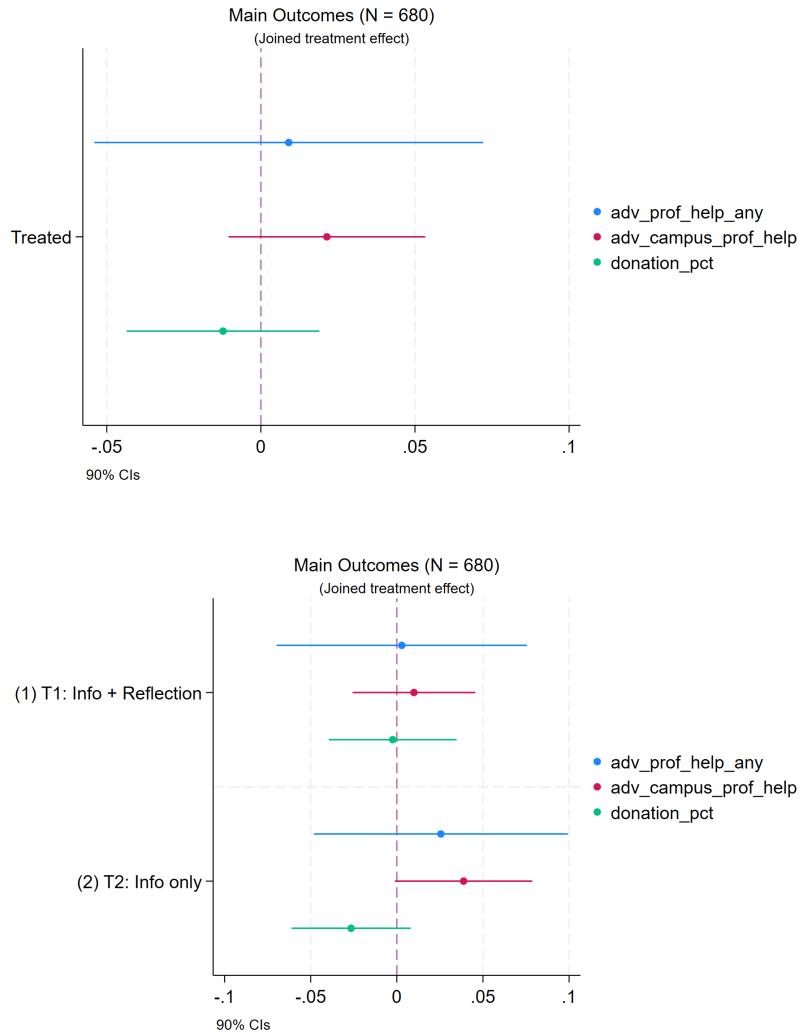
Test	Rate Ratio	Approx. Poisson		Exact Poisson	
		p-value	Reject H_0	p-value	Reject H_0
<i>Panel A: Total Clicks</i>					
T1 vs C	1.32	0.221	False	0.260	False
T2 vs C	2.69	<0.001	True	<0.001	True
T1 vs T2	0.49	<0.001	True	<0.001	True
T1&T2 vs C	2.01	<0.001	True	<0.001	True
<i>Panel B: Unique Clicks</i>					
T1 vs C	1.53	0.107	False	0.118	False
T2 vs C	2.51	<0.001	True	<0.001	True
T1 vs T2	0.61	0.019	True	0.023	True
T1&T2 vs C	2.03	<0.001	True	0.001	True

Peer Advice and Donation

Update with mostly binary versions

	(1)	(2)	(3) Campus Help	(4)	(5)	(6) Campus Help
	Passive	Suggestive		Passive	Suggestive	
Info + Reflection	-0.173** (0.086)	-0.022 (0.097)	0.010 (0.022)			
Info Only	-0.074 (0.093)	-0.058 (0.092)	0.039 (0.024)			
Any Treatment				-0.124 (0.078)	-0.040 (0.081)	0.024 (0.019)
Observations	680	680	680	680	680	680
R2	0.006	0.001	0.004	0.004	0.000	0.002
Control Outcome Mean	0.000	0.000	0.052	0.000	0.000	0.052

I need to write this cleanly—roberto Incentivized advice and donation – ranking questions go to



Appendix

As our treatments aimed at reducing stigma and promoting empathy towards people in mental distress we test whether respondents in different treatment groups provide better/worse advice.

In particular, we provide the following instructions:

Imagine a friend approaches you for emotional support because they are struggling with a personal or academic issue. How would you support them? What would you tell them? Take a moment to provide a **thoughtful response** that could genuinely help someone, which can earn you a **bonus of 50 MXN**. A fellow student will read your (anonymous) advice and rate it as 'Very Useful', 'Somewhat Useful' or 'Not Useful'. Responses rated as 'Very Useful' will earn a bonus of MXN 50.

WTP self, WTP friend

Add quantile regs to appendix – WTP self, WTP friend

5.4 Heterogeneity Analysis

To explore heterogeneity in treatment effects, we interact the pooled treatment indicator with several key variables (focusing on the pre-registered specifications). Below, we outline the specifications for three groups of interest. In all cases, the reference group serves as the baseline category.

Heterogeneity by Incorrect Beliefs

We test whether the treatment effects differ based on the accuracy of students' prior beliefs. Specifically, we examine the following groups:

- Both priors correct (reference group),
- Prior 2 incorrect only,
- Prior 3 incorrect only,
- Both priors incorrect.

The regression model is:

$$Y_i = \alpha + \sum_{j=1}^3 \delta_j \text{BeliefGroup}_{ij} + \sum_{j=1}^3 \phi_j (\text{InfoTreatment}_i \cdot \text{BeliefGroup}_{ij}) + X'_i \gamma + \varepsilon_i,$$

where:

- BeliefGroup_{ij} is an indicator variable for individual i being in belief group j (e.g., "Prior 2 incorrect only"),
- $\text{InfoTreatment}_i \cdot \text{BeliefGroup}_{ij}$ is the interaction term capturing the differential treatment effect for each belief group j ,
- ϕ_j represents the difference in treatment effects for each group relative to the baseline (both priors correct).

Heterogeneity by Distress and Professional Help Use

We explore heterogeneity by groups defined by combinations of mental distress and professional help use:

- No distress + no professional help (reference group),
- No distress + professional help,
- Distress + no professional help,

- Distress + professional help.

The regression model is:

$$Y_i = \alpha + \sum_{j=1}^4 \delta_j DistressGroup_{ij} + \sum_{j=1}^4 \phi_j (InfoTreatment_i \cdot DistressGroup_{ij}) + X'_i \gamma + \varepsilon_i,$$

where:

- $DistressGroup_{ij}$ is an indicator variable for individual i being in distress group j (e.g., "Distress + no professional help"),
- $InfoTreatment_i \cdot DistressGroup_{ij}$ is the interaction term capturing the differential treatment effect for each distress/help group j ,
- ϕ_j represents the difference in treatment effects for each group relative to the baseline (no distress + no professional help).

Heterogeneity by Stigma Index

We also examine how treatment effects vary by levels of the stigma index. The model is specified as:

$$Y_i = \alpha + \beta_1 InfoTreatment_i + \delta StigmaIndex_i + \phi(InfoTreatment_i \cdot StigmaIndex_i) + X'_i \gamma + \varepsilon_i,$$

where:

- $StigmaIndex_i$ is a continuous variable representing individual i 's stigma index score,
- $InfoTreatment_i \cdot StigmaIndex_i$ is the interaction term capturing how treatment effects vary with levels of stigma,
- ϕ measures the marginal change in treatment effect per unit increase in the stigma index.

Interpretation

Each specification allows us to analyze differential treatment effects:

- In the first specification, ϕ_j quantifies whether treatment effects vary based on prior beliefs, relative to those with both priors correct.

- In the second specification, ϕ_j captures how treatment effects differ for combinations of mental distress and professional help use, relative to the baseline group (no distress + no professional help).
- In the third specification, ϕ indicates whether treatment effects are stronger or weaker depending on the level of stigma.

These models provide insights into whether the intervention's effectiveness is moderated by key characteristics of participants.

Treatment Effect Heterogeneity

Bells and whistles go here

Figure 9: TBD

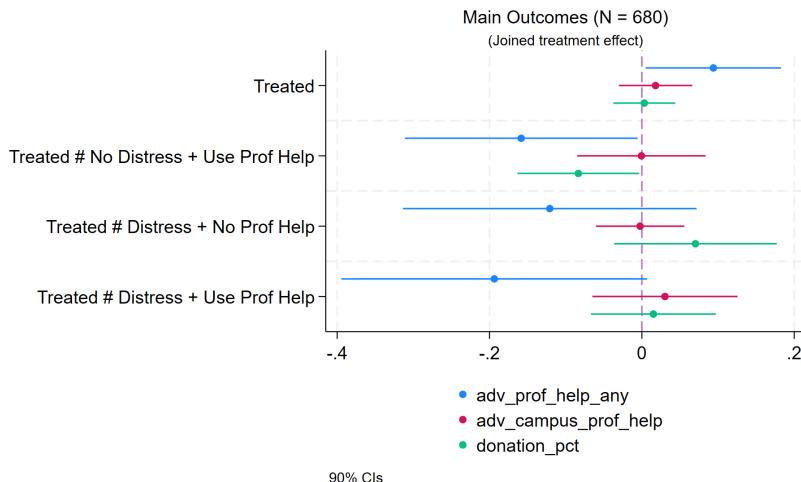
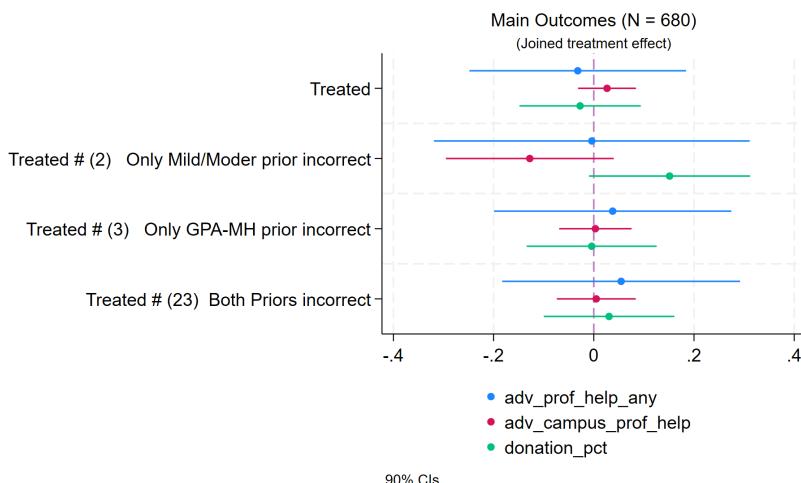


Figure 10: TBD



6 Discussion

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A Appendix: Description of Outcomes

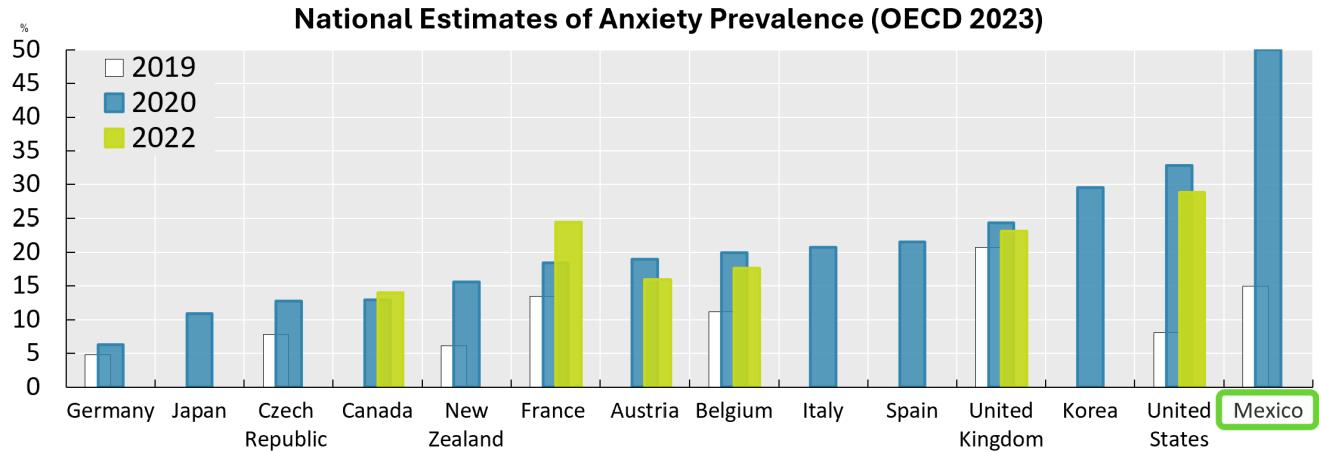
Mental Distress

Apart from the clinical screening procedures, the most common approach to assess depression or anxiety symptoms in a sample is to utilize standardized screening questionnaires. We elicit information on student respondents' mental health in our study using PHQ-4 and GAD-4 short surveys, each containing 4 questions with a total of 8 questions in the questionnaire. These are the shortened versions of PHQ-9 and GAD-7, self-administered diagnostic instruments for reliable and valid measures of depression and anxiety severity ([Kroenke et al. 2001](#), [Spitzer et al. 2006](#)). These screening surveys, widely used for clinical screening in physicians' offices and hospitals as well as for epidemiological measurement, are characterized by high sensitivity (the probability of testing positive when the disorder is present) and high specificity (the probability of testing negative when the disorder is absent).²³

Each question has four possible answers: 'not at all' scores 0 points, 'several days' scores 1 point, 'more than half the days' scores 2 points and 'nearly every day' scores 3 points. This means that participants' scores on each survey (PHQ-4 and GAD-4) range from 0 to 12, so for most of the analysis in the paper we use a combined distress measure relying on all eight questions with a distress index for each person ranging between 0-24 (higher = worse mental health).

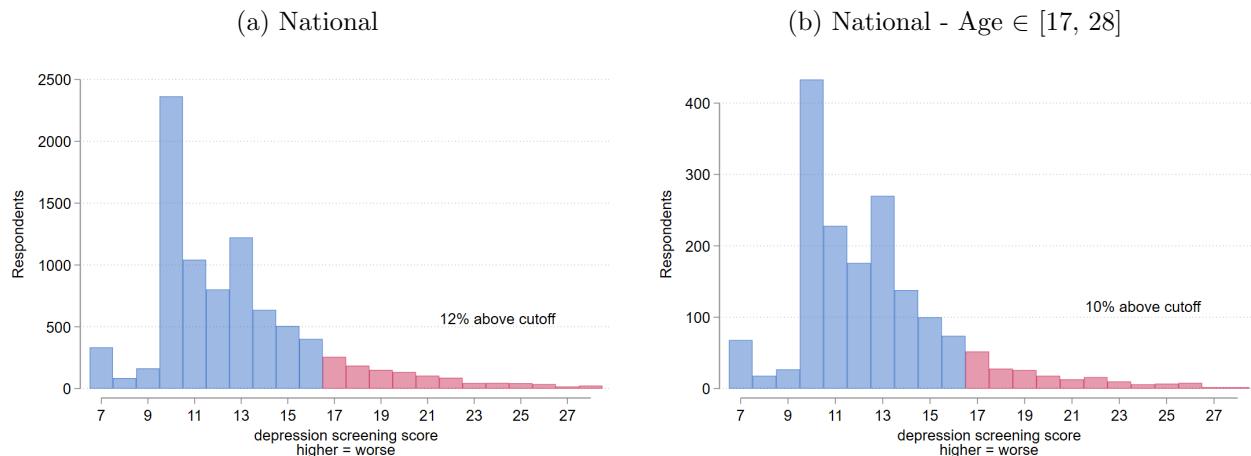
Practitioners sometimes use an ultra-brief screening scale that combines four most diagnostic symptoms – a score of 3 or above (out of 6) is typically used as the cutoff point for concluding that major depressive disorder (for the PHQ) or generalized anxiety disorder (for the GAD) is likely ([Kroenke et al. 2009](#)). Consistent with that, we use a threshold of 12 out of 24 points to indicate that a respondent in our survey exhibits symptoms associated with being in mental distress (distress, hereafter) consistent with moderate or severe depression/anxiety.²⁴

Figure A1: National Estimates of Anxiety Prevalence (OECD 2022)



Notes: This figure shows national estimates of anxiety prevalence across OECD countries over time.

Figure A2: Mental Distress in Mexico - 2023



Notes: This figure shows the distribution of depression screening scores using data from the 2023 Mexican Health and Nutrition Survey (ENSANUT). The survey is representative of the national population. In panel (a) we show the distribution among ENSANUT respondents aged 10 years old or older (sample size = 8,696). In panel (b) we subset respondents to those between 17 and 28 years old to more closely approximate the population of university students (sample size = 1,720).

B Appendix: Figures and Tables

B.1 National Statistics

Depression Screening Scores – ENSANUT

B.2 Mental Health Index and Professional Help Use

²³Major depressive disorder screening questionnaire PHQ-9 exhibits 88% sensitivity and 88% specificity. Generalized anxiety disorder screening questionnaire exhibits 89% sensitivity and 82% specificity (Kroenke et al. 2001, Spitzer et al.

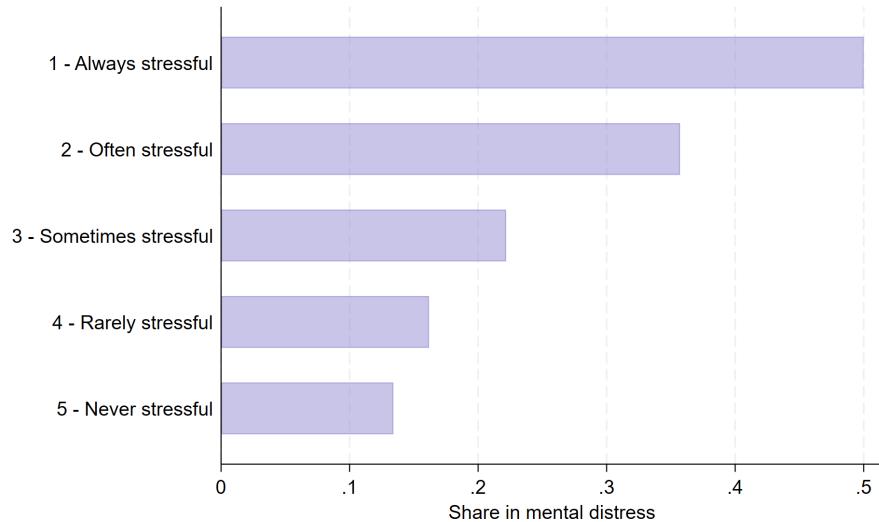


Figure A3: Mental Distress Share by Financial Stress

2006).

²⁴The midpoint cutoff of 12 points is a direct generalization from the cutoff of 6 points for PHQ-2 & GAD-2 instrument - we double the threshold given our scale doubles the range. Given the commonly used threshold of 10 for both PHQ-9 (27 points) and GAD-7 (21 points), one could in principle use the same threshold of 10 for the joint PHQ-4& GAD-4 questionnaire (24 points) we have in our survey – from this end, the threshold of 12 can be viewed as more conservative yielding in a lower bound of student share in distress. Throughout the paper, we focus on a binary split of students into those in distress and not in distress, based on the 12 points cutoff.

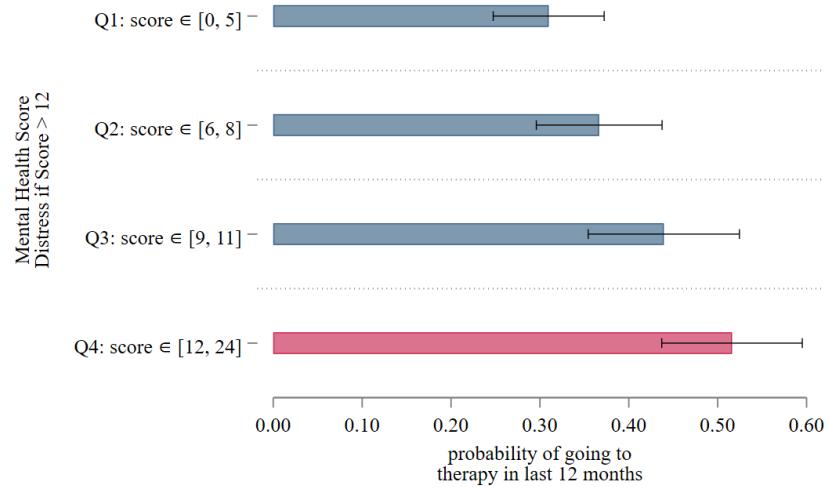


Figure A4: Therapy Use Share by Mental Distress Quartile

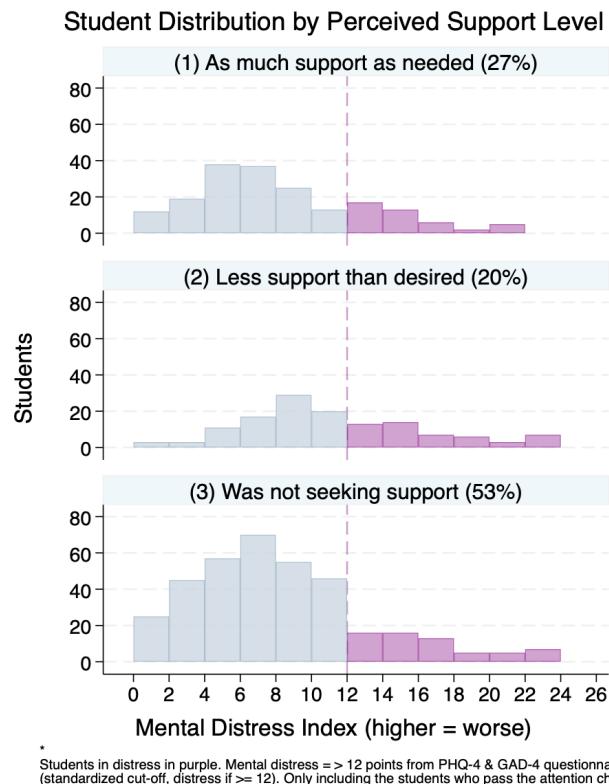


Figure A5: Mental Distress Index Distribution by Perceived Support Level

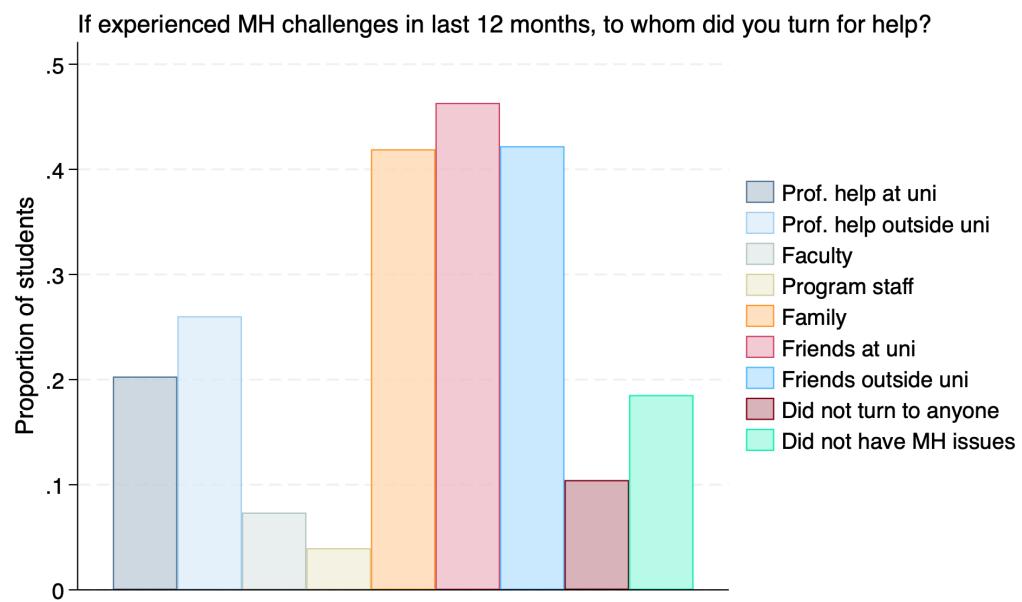


Figure A6: Who Did You Turn For Help?

B.3 Balance on observables

Table A1: Covariate Balance

Variable	N	(0)	(1)	(2)	(3)	N	(1)-(2)	N	(1)-(3)	N	(2)-(3)	
		Control Mean/(SD)	T1: Info + Reflection Mean/(SD)	T2: Info only Mean/(SD)	Mean difference		Pairwise t-test Mean difference		Mean difference		Mean difference	
Age	232	20.159 (1.848)	227	20.084 (2.218)	221	20.208 (1.822)	459	0.076	453	-0.049	448	-0.124
Female	232	0.461 (0.500)	227	0.533 (0.500)	221	0.538 (0.500)	459	-0.072	453	-0.077	448	-0.005
Financially Stressed	232	0.530 (0.500)	227	0.599 (0.491)	221	0.543 (0.499)	459	-0.069	453	-0.013	448	0.056
Has Scholarship	232	0.651 (0.478)	227	0.718 (0.451)	221	0.706 (0.457)	459	-0.067	453	-0.055	448	0.012
Receives a full scholarship	232	0.082 (0.275)	227	0.084 (0.278)	221	0.072 (0.260)	459	-0.002	453	0.009	448	0.011
Moved Residence	232	0.591 (0.493)	227	0.626 (0.485)	221	0.615 (0.488)	459	-0.035	453	-0.025	448	0.010
GPA	232	90.897 (4.659)	227	90.784 (5.394)	221	91.235 (3.925)	459	0.112	453	-0.339	448	-0.451
MH Score	232	8.569 (5.132)	227	8.048 (5.003)	221	8.430 (5.110)	459	0.521	453	0.139	448	-0.381
Used Therapy L12 Months	232	0.233 (0.424)	227	0.181 (0.386)	221	0.290 (0.455)	459	0.052	453	-0.057	448	-0.109***
Open to Share MH Challenges	232	0.392 (0.489)	227	0.339 (0.474)	221	0.371 (0.484)	459	0.053	453	0.021	448	-0.032
Self-stigmatize	232	0.323 (0.469)	227	0.295 (0.457)	221	0.276 (0.448)	459	0.028	453	0.047	448	0.019

Notes: This table shows balance on covariates across treatment groups. For each covariate we show each experimental group's sample mean and standard deviation, as well the difference in means across pairs of groups. Age measures the respondent's age in years, female is an indicator equal to one if the respondent is female-born, financially stressed is an indicator equal to one if the respondent described her financial situation as "Always", "Often" or "Sometimes" stressful and equal to 0 if she reported it as "Rarely" or "Never" stressful, Has scholarship is an indicator equal to one if the respondent has at least some amount of scholarship, receives a full scholarship is an indicator equal to one if the respondent's scholarship covers 100% of tuition, moved residence is an indicator equal to one if the respondent moved her residence city to pursue her current studies, GPA measures the respondent's current overall GPA on a scale from 0–100, MH score measures the student's mental health score as described in section 2, used therapy in L12 months is an indicator equal to one if the respondent states having used therapy in the last 12 months, open to share MH challenges is an indicator equal to one if the respondent states she would be willing to share about her own personal MH challenges with others and self-stigmatize is an indicator equal to one if the respondent states she would be disappointed in herself if she suffered from mental distress. Standard errors for the difference in means test are heteroskedasticity robust. Significance levels: * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$

C Appendix: Descriptions of Outcomes

AB: name has to change clearly

C.1 Incentivized bonus questions

The eight bonus questions included: (1) guessing the percentage of “Yes” responses to the question regarding therapy usage in the past 12 months which was compared to the actual calculated percentage; (2) guessing the percentage of “Yes” responses to the question on willingness to share therapy information, which was similarly compared to the actual percentage; (3) responding “22” to a specific survey question, which earned the bonus if correct; (4) guessing the percentage of ”Agree” responses (including ”Strongly Agree,” ”Agree,” and ”Somewhat Agree”) to a question on self-stigma, validated against the computed percentage; (5) answering ”Yes” to a question about therapy effectiveness, which directly earned the bonus; (6) answering ”Yes” to a question about therapy effectiveness for mild-to-moderate conditions , which similarly earned the bonus; (7) categorizing the correlation between mental health scores and grade point averages into predefined categories such as ”Better” or ”Much Worse” , with correctness determined by the computed correlation; and (8) providing open-ended advice on a specific topic, where responses deemed ”Very useful” during review earned the bonus.

C.2 Stigma Index

In the context of the study we seek to create a unified measure of stigma taking into account three distinct dimensions.

- **Perceived Public Stigma:** This dimension is defined by three variables that measure the perception fo stigma of other students, professors, and parents.
- **Self-Stigma:** This dimension corresponds to a variable that measures the number of people out of 100 that would feel disappointment for experiencing any mental health issues.
- **Personal Stigma:** This third dimension corresponds to two dummy variables measuring preference of a lower GPA over experiencing mental health symptoms and talking about mental healthy issues.

The following tables provides a comprehensive description of the variables present across the 3 dimensions. From these classifications we aim to implement not only a PCA to generated an index, but also a weighted average.

Table A2: Mental Health Stigma Variables

Variable Name	Definition
Perceived Public Stigma	
From students	Percentage of students that the respondent believes would view a student negatively for experiencing mental health issues like anxiety or depression.
From professors	Percentage of professors that the respondent believes would view a student negatively for experiencing mental health issues like anxiety or depression.
From parents	Percentage of student parents that the respondent believes would view a student negatively for experiencing mental health issues like anxiety or depression.
Self-Stigma	
Self stigma	Respondent's estimate of how many out of 100 students would feel disappointed in themselves if they had a mental health issue.
Personal Stigma	
Low GPA over MH symptoms	Dummy variable where it has a value of 1 if the respondent ranked low GPA as more acceptable than experiencing mental health distress symptoms; 0 otherwise.
Low GPA over MH talk	Dummy variable where it has a value of 1 if the respondent ranked low GPA as more acceptable than talking about mental health issues; 0 otherwise.

C.3 Weighted Average

To create a unified measure of mental health stigma, we developed indices that account for three distinct dimensions of stigma: *Perceived Public Stigma*, *Self-Stigma*, and *Personal Stigma*. Each dimension was represented by relevant variables described in the table above, and the methodology for index construction is outlined below.

Creation of Indicators for Mean and Median Thresholds

For each variable within the stigma dimensions, we created binary indicators based on whether the value exceeded the dimension-specific mean or median:

- **Perceived Public Stigma:** Indicators were generated for students, professors, and parents by comparing their reported percentages against the mean and median thresholds:
 - Students: > 26.35 (mean), > 20 (median)
 - Professors: > 26.61 (mean), > 20 (median)
 - Parents: > 40.11 (mean), > 39.5 (median)
- **Self-Stigma:** The self-stigma variable was binarized using thresholds:

- > 49.79 (mean), > 50 (median)

- **Personal Stigma:** Personal stigma was directly represented by two binary variables:

- Preference for a lower GPA over experiencing mental health symptoms
- Preference for a lower GPA over talking about mental health issues

Aggregation Within Dimensions

For each dimension, aggregated measures were computed based on the share of binary indicators satisfied:

- **Perceived Public Stigma:** Calculated as the mean of the three binary indicators for students, professors, and parents.
- **Self-Stigma:** The binary indicator itself represented this dimension, as it is a single variable.
- **Personal Stigma:** Calculated as the mean of the two binary indicators for preferences.

Standardization of Aggregates

To account for potential variation across treatment groups, the aggregated shares for each dimension were standardized. This was achieved by centering the values around the control group's mean and dividing by the standard deviation.

Construction of Composite Indices

Two composite indices were created to represent overall stigma:

- **Mean-Based Index:** The standardized scores of the three dimensions (Perceived Public Stigma, Self-Stigma, and Personal Stigma) were summed to create a composite score. This was further standardized for interpretability.
- **Median-Based Index:** Similarly, the standardized scores derived from median thresholds were summed to create an alternative composite score.

Table A3: Summary Statistics for Stigma Dimensions (Mean and Median Thresholds)

Dimension	Threshold Type	Mean	Std. Dev.	Min–Max
Perceived Public Stigma	Mean-based	0.428	0.396	0–1
	Median-based	0.492	0.397	0–1
Self-Stigma	Mean-based	0.513	0.500	0–1
	Median-based	0.469	0.499	0–1
Personal Stigma	Mean-based	0.204	0.337	0–1
	Median-based	0.204	0.337	0–1

Table A4: Summary Statistics for Composite Stigma Indices

Index	Standardization	Mean	Std. Dev.	Min–Max
Composite Index (Mean-based)	Raw	-0.107	1.847	-2.787 – 4.573
	Standardized	-0.055	0.948	-1.431 – 2.348
Composite Index (Median-based)	Raw	-0.117	1.836	-2.879 – 4.498
	Standardized	-0.061	0.958	-1.502 – 2.347

Table A5: Correlations Between Stigma Dimensions and Composite Indices

Dimension	Perceived Public Stigma	Self-Stigma	Personal Stigma	Composite Index
<i>Mean-Based Composite Index</i>				
Perceived Public Stigma	1.0000	0.2455	-0.0177	0.6612
Self-Stigma	0.2455	1.0000	0.0255	0.6863
Personal Stigma	-0.0177	0.0255	1.0000	0.5248
Composite Index	0.6612	0.6863	0.5248	1.0000
<i>Median-Based Composite Index</i>				
Perceived Public Stigma	1.0000	0.2550	-0.0293	0.6695
Self-Stigma	0.2550	1.0000	-0.0041	0.6805
Personal Stigma	-0.0293	-0.0041	1.0000	0.5053
Composite Index	0.6695	0.6805	0.5053	1.0000

Weighted Average Stigma Index Amongst Distressed and Non-Distressed Individuals

Table A6: Summary of Composite Stigma Indices by Mental Distress Groups

Mental Distress Group	Mean (Mean-Based Index)	Mean (Median-Based Index)	SD (Mean-Based Index)	SD (Median-Based Index)
No Distress (0)	-0.1023	-0.1075	0.9784	0.9855
In Distress (1)	0.1058	0.0952	0.8192	0.8414
Total	-0.0549	-0.0613	0.9479	0.9578

Table A7: T-Test Results for Composite Stigma Indices by Distress Groups

Index	Group	Obs	Mean	Std. Err.	95% CI	p-value (two-tailed)
Mean-Based Index	No Distress	525	-0.1023	0.0427	[-0.1862, -0.0184]	0.0162
	In Distress	155	0.1058	0.0658	[-0.0242, 0.2358]	
	Difference		-0.2081	0.0863	[-0.3776, -0.0386]	
Median-Based Index	No Distress	525	-0.1075	0.0430	[-0.1920, -0.0230]	0.0205
	In Distress	155	0.0952	0.0676	[-0.0383, 0.2287]	
	Difference		-0.2027	0.0873	[-0.3741, -0.0314]	

The results of the two-sample t-tests indicate a significant difference in stigma indices (mean and median) between individuals with "No Distress" (No D) and those "In Distress" (In D). For the stigma index based on the mean, individuals in the "No D" group had a significantly lower stigma index (Mean = -0.102, Std. Dev = 0.978) compared to those in the "In D" group (Mean = 0.106, Std. Dev = 0.819), with a mean difference of -0.208 (95% CI: -0.378 to -0.039; $t = -2.4101$, $p = 0.0162$ for the two-tailed test). Similarly, for the stigma index based on the median, the "No D" group had a lower stigma index (Mean = -0.108, Std. Dev = 0.986) compared to the "In D" group (Mean = 0.095, Std. Dev = 0.841), with a mean difference of -0.203 (95% CI: -0.374 to -0.031; $t = -2.3228$, $p = 0.0205$ for the two-tailed test).

These findings suggest that individuals in distress experience higher levels of stigma compared to those not in distress. The statistical significance ($p < 0.05$) and confidence intervals that exclude zero provide strong evidence that these differences are unlikely due to random chance. Although the effect sizes (mean differences of -0.208 and -0.203) are relatively small, the results underscore the need for targeted interventions to address stigma among distressed individuals.

Index from Weighted Average

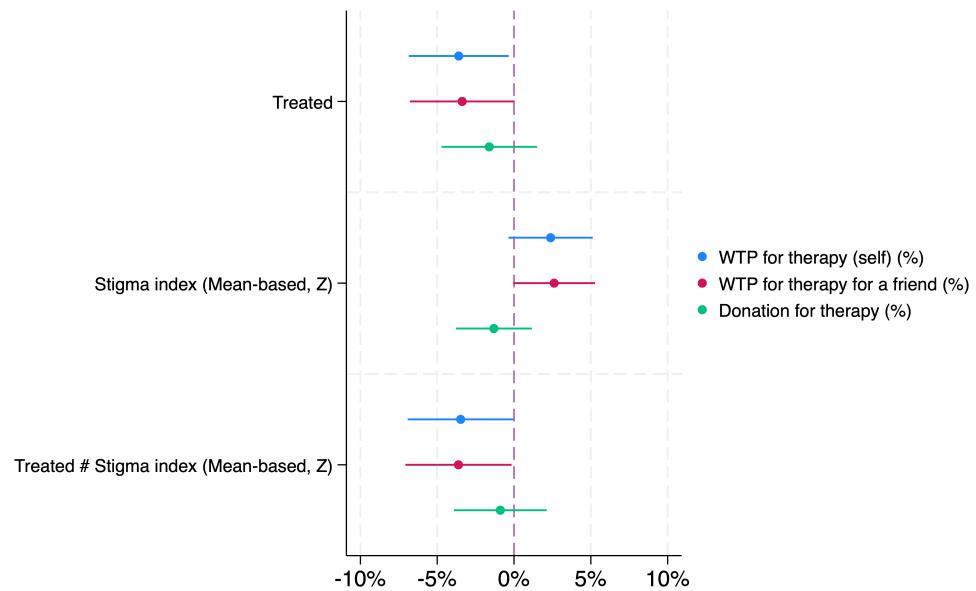


Figure A7: Main Effects by Mean Stigma Index.
Effect by treatment group and 90% Confidence Intervals.

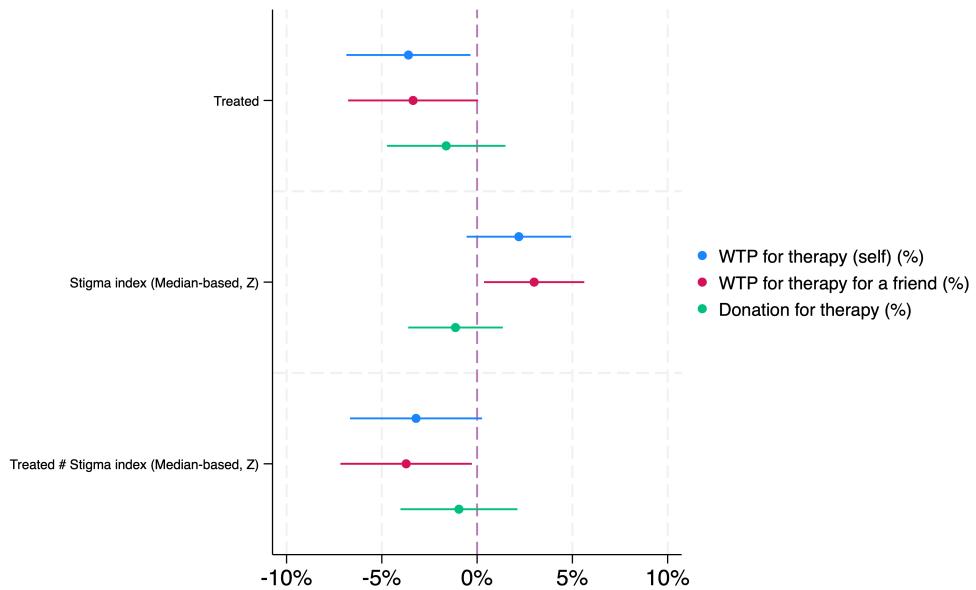


Figure A8: Main Effects by Median Stigma Index.
Effect by treatment group and 90% Confidence Intervals.

C.4 PCA

Principal Component Analysis (PCA) is employed as a dimensionality reduction technique to distill key insights from a dataset with multiple variables while minimizing the loss of critical information ([Jaadi & Whitfield \(2024\)](#)), the context of our research on mental health stigma among university students, PCA enables us to synthesize a complex set of variables—such as perceptions of therapy, barriers to seeking help, and beliefs about peer behavior—into a smaller number of components. These components capture the majority of the variance within the original dataset, providing a simplified yet meaningful representation of the underlying patterns.

In this analysis, PCA helps identify the primary dimensions of mental health stigma, which we use to construct an index reflecting the most significant factors influencing students' attitudes and behaviors. Initially, all components and loadings are considered, but subsequent iterations focus on those with the highest explained variance and loadings of 0.3 or above. This filtering ensures that we emphasize the most informative relationships between variables. Prior to applying PCA, all variables are standardized to ensure comparability and to give equal weight to each variable, regardless of its original scale.

This approach not only simplifies our data analysis but also provides a robust foundation for understanding the most influential factors shaping students' mental health perceptions and their decision-making regarding therapy.

Table A8: Summary Statistics for Stigma Variables and PCA Indexes

Variable	Observations	Mean	Std. Dev.	Min–Max
Stigma Index PCA1	680	0.000	1.00	-1.93 – 3.47
Stigma Index PCA2	680	0.000	1.00	-0.80 – 2.66
Stigma Students (Std.)	680	0.000	1.00	-1.22 – 3.40
Stigma Professors (Std.)	680	0.000	1.00	-1.20 – 3.31
Stigma Parents (Std.)	680	0.000	1.00	-1.57 – 2.34
Guess Self-Stigma (Std.)	680	0.000	1.00	-2.20 – 2.21
Low GPA Symptoms (Std.)	680	0.000	1.00	-0.61 – 1.65
Low GPA Talk (Std.)	680	0.000	1.00	-0.40 – 2.50

PCA Results

Table A9: Principal Components Analysis Summary

Component	Eigenvalue	Difference	Proportion	Cumulative
Component 1	2.3835	0.9320	0.3972	0.3972
Component 2	1.4515	0.6114	0.2419	0.6392
Component 3	0.8401	0.2902	0.1400	0.7792
Component 4	0.5499	0.0839	0.0917	0.8708
Component 5	0.4660	0.1569	0.0777	0.9485
Component 6	0.3090	—	0.0515	1.0000

Summary Statistics:	
Number of observations	680
Number of components	2
Trace	2
Rotation (unrotated)	Principal
Rho	0.6392

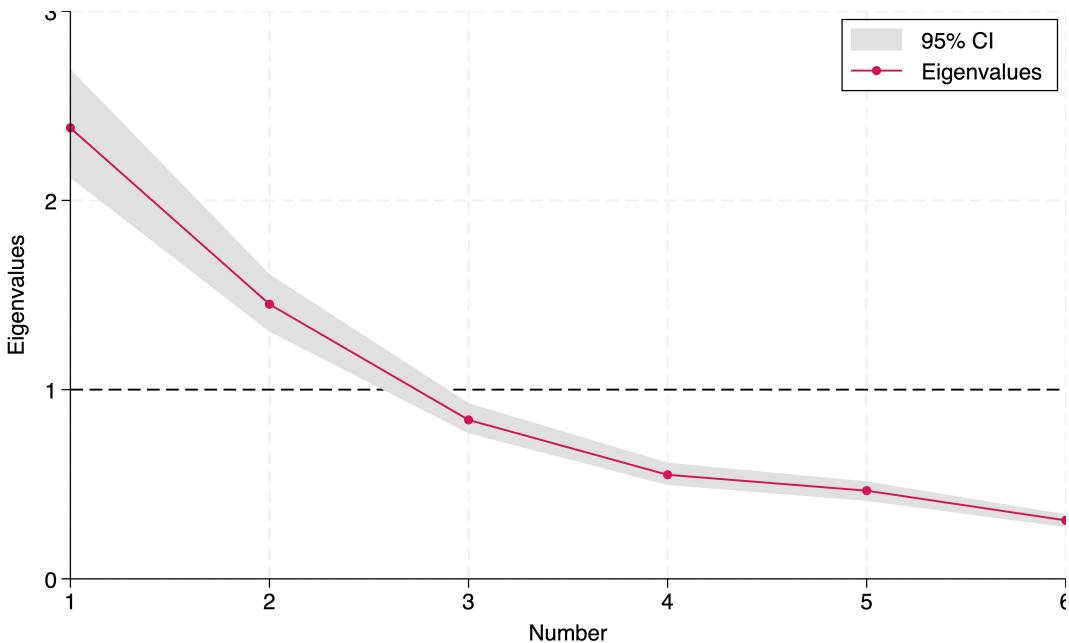


Figure A9: PCA Scree Plot

Eigenvalues are the measure of how much variance (information) each principal component explains in the dataset. Larger eigenvalues indicate components that explain more variance. From the initial PCA results in the table above and from the screeplot we can observe that only the first two components have eigenvalues of 1 and above - meaning they each explain greater variance than the rest of the components - which will be the ones we shall be keeping, and the only components we shall be considering when looking at the loadings.

Table A10: Principal Components (Eigenvectors)

Variable	Component 1	Component 2	Component 3	Component 4	Component 5
stigma_students	0.5358	0.0351	-0.1130	0.0557	-0.7420
stigma_professors	0.5649	0.0359	-0.2256	-0.0323	0.0352
stigma_parents	0.5359	-0.0216	-0.2206	-0.0214	0.6617
self_stigma	0.3206	0.0934	0.9365	0.0610	0.0811
low_GPA_over_sympt	-0.0269	0.7059	-0.0124	-0.7062	-0.0142
low_GPA_over_talk	-0.0551	0.7000	-0.1020	0.7021	0.0593

The loadings - the coefficients, or weights - from the Principal Component Eigenvectors table above represent the contribution of each variable to a given principal component. In the next iteration only loadings above .3 will be considered in order to better interpret components. Subsequently, we make sure the first two components we have focused on are not correlated amongst each other.

Table A11: Correlation Matrix of Principal Components

	pc1	pc2
pc1	1.0	-
pc2	0.0	1.0

Table A12: Correlation of Stigma Index PCA1 with Components

Variable	PCA1	Stigma Students	Stigma Professors	Stigma Parents	Guess Self-Stigma	Low GPA Over Symptoms	Low GPA Over Talk
PCA1	1.0000						
Stigma Students	0.8272***	1.0000					
Stigma Professors	0.8721***	0.6384***	1.0000				
Stigma Parents	0.8273***	0.5307***	0.6574***	1.0000			
Guess Self-Stigma	0.4950***	0.2953***	0.2674***	0.2525***	1.0000		
Low GPA Symptoms	-0.0850*	-0.0245	-0.0287	-0.0640	-0.0016	1.0000	
Low GPA Talk	-0.0415	-0.0086	0.0044	-0.0436	0.0407	0.4487***	1.0000

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A13: Correlation of Stigma Index PCA2 with Components

Variable	PCA2	Stigma Students	Stigma Professors	Stigma Parents	Guess Self-Stigma	Low GPA Over Symptoms	Low GPA Over Talk
PCA2	1.0000						
Stigma Students	0.0423	1.0000					
Stigma Professors	0.0433	0.6384***	1.0000				
Stigma Parents	-0.0260	0.5307***	0.6574***	1.0000			
Guess Self-Stigma	0.1125**	0.2953***	0.2674***	0.2525***	1.0000		
Low GPA Symptoms	0.8434***	-0.0245	-0.0287	-0.0640	-0.0016	1.0000	
Low GPA Talk	0.8504***	-0.0086	0.0044	-0.0436	0.0407	0.4487***	1.0000

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

PCA Interpretation

Component 1 primarily captures perceptions of stigma from various groups (students, professors, parents), while Component 2 reflects preferences related to mental health versus academic performance (low GPA acceptance). The following loading plot showcases the previous loadings and how related they are to each component.

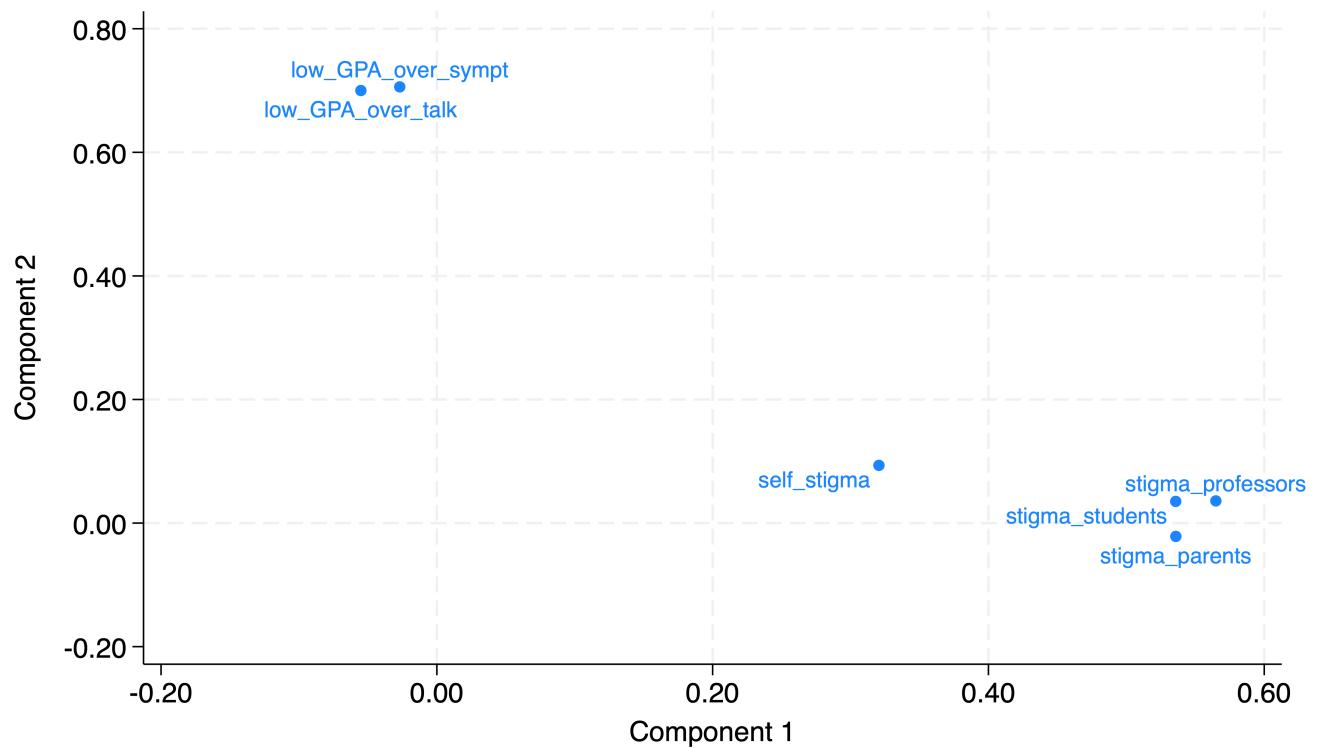


Figure A10: PCA Loading Plot

Index from PCA

After having done and examined the 2 components of the PCA, we proceed to construct two indexes from component 1 and component 2, we then proceed to interact of our treatment groups with the our standardized stigma index with outcome variables being WTP for therapy, for self, for a friend and lastly the donation amount an individual is willing to give to help someone access mental health services.

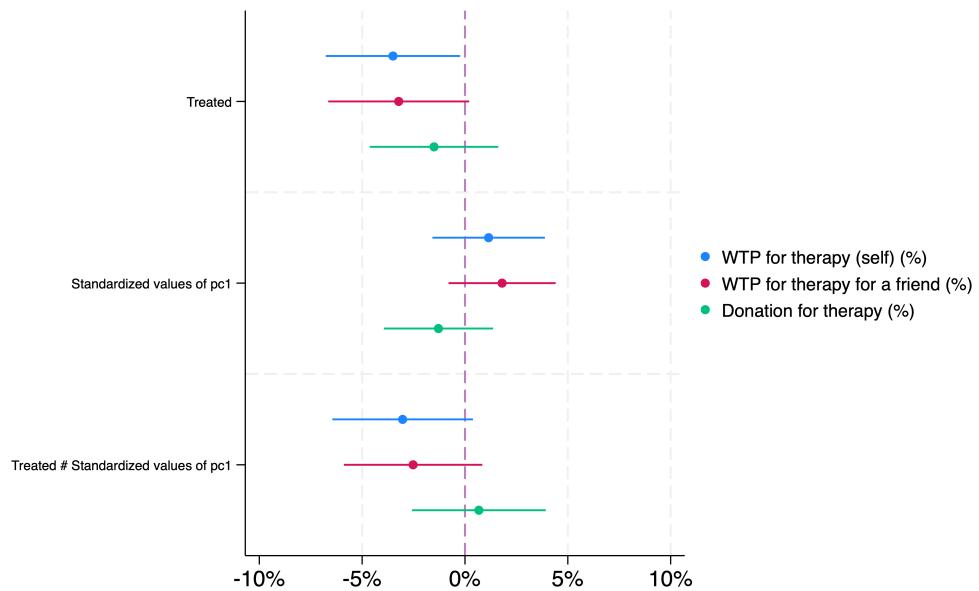


Figure A11: Main Effects by Component 1 Stigma Index.
Effect by treatment group and 90% Confidence Intervals.

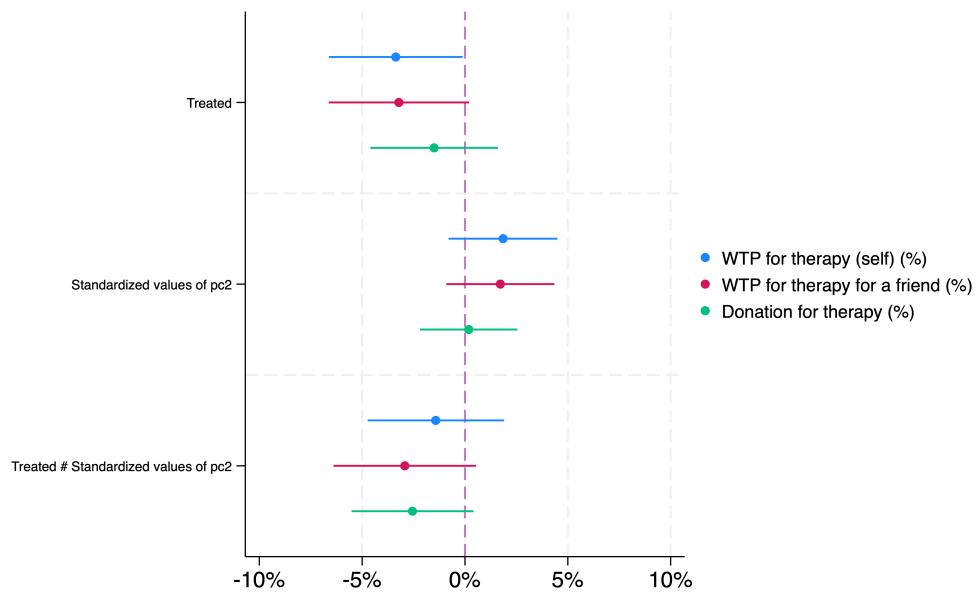


Figure A12: Main Effects by Component 2 Stigma Index.
Effect by treatment group and 90% Confidence Intervals.

C.5 Advice Indicators for mentioning words or phrases

Table A14: Advice Given

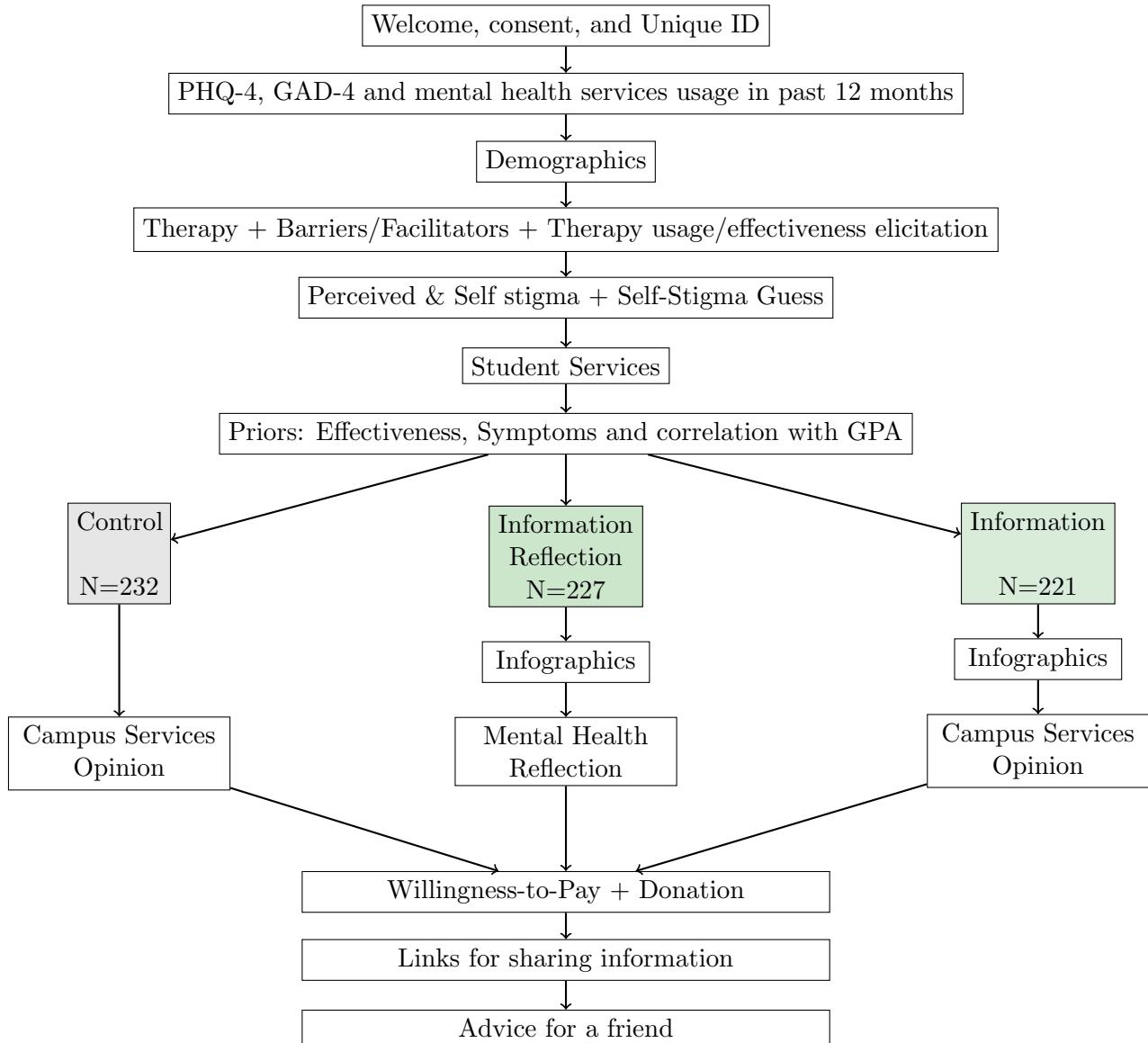
	(1) Listen	(2) Be Attentive	(3) Empathy	(4) Validate Feelings	(5) Show Support	(6) Give Opinion	(7) Seek Help	(8) Mention Therapy	(9) Do Stuff You Enjoy
Any Treatment	-0.018 (0.040)	-0.055 (0.038)	-0.048 (0.032)	0.016*** (0.006)	-0.039* (0.023)	0.008 (0.030)	-0.028 (0.040)	0.001 (0.029)	0.002 (0.006)
Observations	680	680	680	680	680	680	680	680	680
R2	0.000	0.003	0.004	0.005	0.005	0.000	0.001	0.000	0.000
Control Mean	0.435	0.336	0.207	0.000	0.103	0.164	0.414	0.155	0.004

Table A15: Advice Given

	(1) Listen	(2) Be Attentive	(3) Empathy	(4) Validate Feelings	(5) Show Support	(6) Give Opinion	(7) Seek Help	(8) Mention Therapy	(9) Do Stuff You Enjoy
Info + Reflection	-0.021 (0.046)	-0.085** (0.042)	-0.062* (0.035)	0.018** (0.009)	-0.046* (0.025)	0.017 (0.035)	-0.053 (0.046)	0.030 (0.035)	0.009 (0.009)
Info Only	-0.015 (0.047)	-0.024 (0.044)	-0.035 (0.037)	0.014* (0.008)	-0.031 (0.027)	-0.001 (0.035)	-0.002 (0.046)	-0.028 (0.033)	-0.004 (0.004)
Observations	680	680	680	680	680	680	680	680	680
R2	0.000	0.006	0.004	0.006	0.005	0.000	0.002	0.004	0.005
Control Mean	0.435	0.336	0.207	0.000	0.103	0.164	0.414	0.155	0.004

C.6 Survey flowchart

Figure A13: Survey Flow



Notes: This figure depicts the survey flow.